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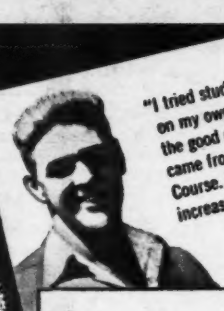

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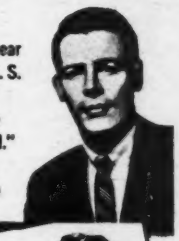

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MECHANIX ILLUSTRATED is published monthly by Fawcett Publications, Inc., Fawcett Bldg., Greenwich, Conn.

ADDRESS ALL MAIL: Subscriptions, change of address, Form 3579 to Subscription Dept., Fawcett Bldg., Greenwich, Conn.; and all editorial and advertising to Fawcett Publications, Inc., 67 W. 44th St., New York 36, N. Y.

Second-class postage paid at Greenwich, Conn., and at additional mailing offices.

EDITORIAL OFFICES: 67 W. 44th St., New York 36, N. Y. ADVERTISING OFFICES: 67 W. 44th St., New York 36, N. Y.; 612 N. Michigan Ave., Chicago 11, Ill.; 1532 Guardian Bldg., Detroit 26, Mich.; 2978 Wilshire Blvd., Los Angeles 5, Calif.; 681 Market St., San Francisco 5, Calif.; 123 S. Broad St., Philadelphia 9, Pa.; Hale Printup & Associates, Langford Bldg., Miami 32, Fla. and 1401 Peachtree St., N.E., Atlanta 9, Ga.

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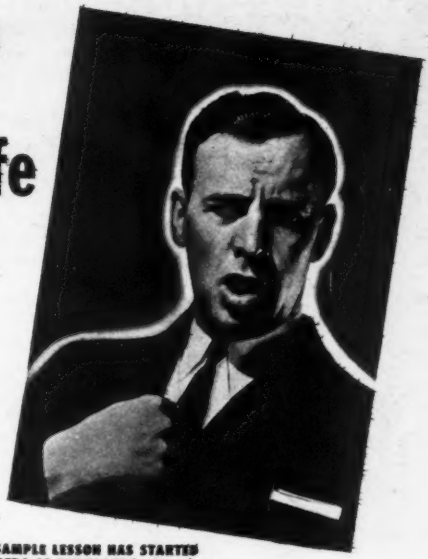

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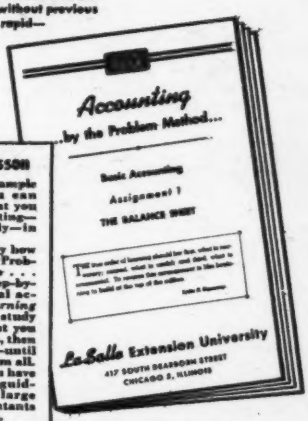

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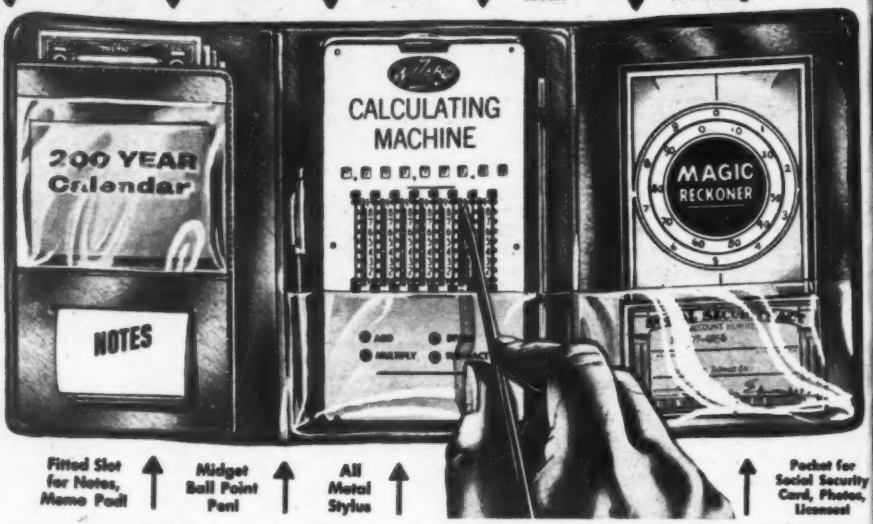

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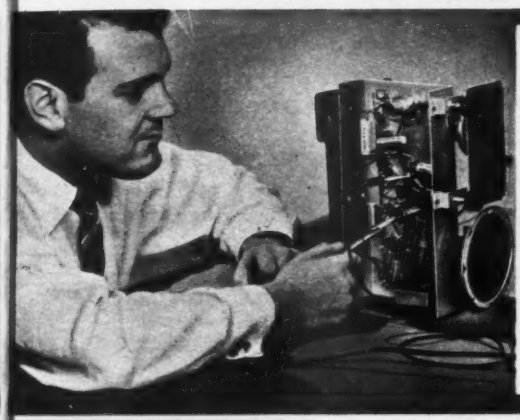

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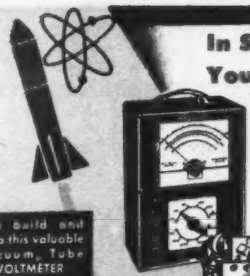

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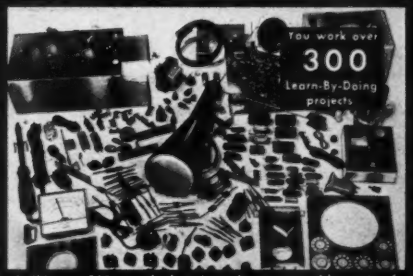

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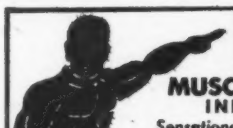

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IF YOU HAVE A low-pay job with little security and no future, it's time you gave yourself a fresh start. It's never too late to launch a new career in a huge, booming industry such as Air Conditioning and Refrigeration. The government reports that during the past 12 years, production of air conditioners increased 400%. No other industry did better! Thanks to this fabulous growth, over 20,000 newly-trained technicians and mechanics are needed each year to fill a wealth of steady, good-pay jobs. Get set for success: Train at home in spare time. It's easy and it's practical. For full information, *fill out and mail handy coupon.*

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CTI offers you a short-cut to success. You learn by practicing with real operating equipment! CTI sends you 25 big kits of parts and tools to build a ¼ h.p. commercial-type, heavy-duty condensing unit (illustrated at right.) You perform experiments, complete many projects, and get experience much like in the field. This is the practical way to learn and only CTI has it. Only CTI combines practice with easy-to-understand theory.

When you finish assembling condenser (above), you may then build an air conditioner, freezer, refrigerator or milk cooler. CTI also sends mechanic's tools (left.) You keep all tools and equipment.

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David Black
Bronx, N. Y.

There is no boat that will hold four ten-year-old boys safely.

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We have formed a kart club centering in the Hudson Valley area. Although we are only two months old we have 50 avid karting members. Eventually we hope to have our own track. Right now we are interested in new and active members. Anyone interested in our club can write to me.

Ruth Orphan
P.O. Box 155
Clintondale, N. Y.

I have been appointed chairman of the Kart Kommittee of the Saskatchewan Sports Car Club. The local Optimists are also interested in planning races for youngsters. Those interested please write to me.

R. A. Elson
2949 Elphinstone St.
Regina, Saskatoon

• *King Tut Butts In*

I read your article in the July 1959 MI entitled Can Mind Reading End Wars? and I do not agree that extra-sensory perception is what you are looking for. It is spiritualism that will solve your problems. The story of the young lady telling the gentleman of the death of his son, in Greek, about which she knew nothing, is the spirit of his dead son speaking through her. With spiritualism I have foretold the destiny of nations. In November 1893, in Northern Zululand, I was introduced by a Zulu witch doctor to the spirit of the Pharoah Tutankhamen who has followed my fortunes for over 60 years. The greatest thing he has done has been to go to Berlin early in September 1940, to sit in with Hitler and his generals while they were discussing the invasion of Russia. Ten days later I wrote to the government suggesting that I should be sent to Moscow to warn Stalin. The government did not employ me but my letter was sent on to England and enabled Churchill to warn Stalin.

R. H. S.
Johannesburg, S. A.

• *Answer Man*

If any of your readers are interested, I will endeavor to answer any question on any subject, especially hobbies, for the small fee of 50 cents.

W. H.
Toronto, Ont.

Fifty cents is a small fee for an answer but a bit steep for a mere endeavor. Can't you lower your price a little?

[*Continued on page* 15]

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That's right! The next 10 minutes may start a chain reaction that may help you SKYROCKET YOUR INCOME TO $25,000 A YEAR! If you're earning $5,000 to $10,000 right now . . . if hard work, ambition and ability seem to be getting you no higher . . . then here's that LUCKY BREAK you've been looking for! Here's your BIG CHANCE to "strike it rich" faster than you ever dreamed possible! Regardless of your age, regardless of your past experience, here's a golden opportunity to forge ahead in a business of your own—without endangering your present income or job—without investing a bundle. Yes, you can now break out of the "ordinary job trap" and soar to new heights. You can increase your MONEY MAKING POWER by following the same paths that led other men, like yourself, to fame and fortune. It's much easier than you think—and I'll prove it to you *without asking you to risk one penny.* With your permission, I'm going to send you a book in the next few days that's going to *lift you right off the seat of your chair!*

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This book will excite you. Its pages shine bright green with money! Fresh-minted $100 bills . . . crisp, crinkly stock certificates . . . imposing title deeds . . . money and income in every shape and form, yours as a reward for reading the book and putting its million dollar ideas to work!

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Find it hard to believe? Perhaps so—but you can verify my statements. When the book arrives, please do this:

First: take a look at page 136 and see 12 different kinds of sideline businesses you can start with almost no capital at all! These enterprises require no specialized knowledge. They are so unusual that almost no competition exists. Yet the need for them is so great that a few people like yourself are now taking in *as much as $35,000 a year from them!*

Second: turn to pages 62-66. Here you'll learn how easy it is to pick up inventories of bankrupt firms at a fraction of true value, then quickly dispose of them at a profit of 200% to 400%. How you can buy up accounts receivables for maybe 10c on the dollar, then collect 60c or 70c on the dollar! How you can act as a middleman negotiating business deals between two firms—and collect a fat commission. Plus other opportunities every bit as lucrative, almost under your nose!

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Where to Find Your Private Pot-of-Gold

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Mr. John Alan Appleman is an attorney, specializing in estate planning for physicians, manufacturers, ranchers, businessmen, etc. He is the author of 36 books, plus many articles which have appeared in numerous top magazines including the Reader's Digest. He has written a two-volume text on estate planning, and articles on legal subjects for the Encyclopaedia Britannica. He is a nationally-recognized authority.

Just a few words about the stock market. Please glance at page 51 . . . and discover what is probably the most lucrative, yet most overlooked field of investment in Wall Street. I'll tip you off to an industry where "insiders" are making fabulous gains today. For instance, if you'd put only $100 into Stock "A" two years ago, you'd have $5,000 right now . . . and if you'd put that $100 into Stock "B," your money would have amounted to $9,500!

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Want to open a retail store? You'll be told how to select a field with a promising future and build your business to success. Or possibly you've got your eye on manufacturing, insurance, hotel or the restaurant field—contracting or a service occupation. If you go about it in the right way, you can make a fortune in any of these fields.

Blaze Your Trail in Search of Wealth Along Some Paths of America's Self-Made Millionaires

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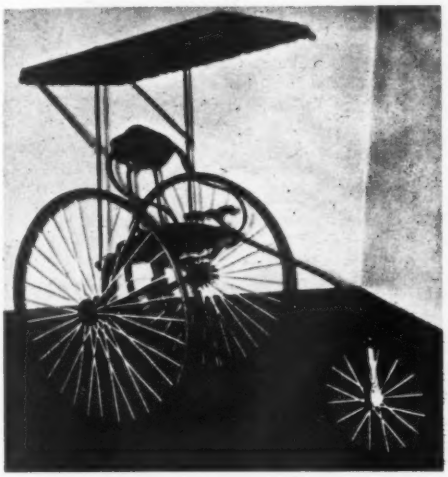
Dear Editor

[Continued from page 12]

• *Alligator?*



I am sending a photo of a tricycle I found. I have been told it is over 85 years old. It is foot-propelled. Wheels are 36 inches high. Can you help me find out how old it is and where it was made?

John D. Colbert
37 Xenia Ave.
Dayton, Ohio

OK, readers—is it an Alligator or a Crocodile? Who made it? Where? When? Why? Our Ouija board says the Curator of Land Transportation, Smithsonian Institution, Washington 25, D. C., may be able to help.

• *Autograph Camera*

In Inventions Wanted! (Feb. MI) Mrs. Riggs suggested a camera with a built-in date recorder. Eastman Kodak Co. put out an Autograph Camera years ago. It had a slot in back which was pulled down and with a small steel pencil you could autograph each negative.

S. G. Yates
Peoria, Ill.

• *Pin-Up*

On page 144 of your latest issue there appears a photo of the full moon. I am very much interested in obtaining a photograph

[Continued on next page]

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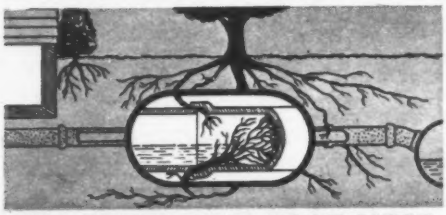

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like that. I intend to blow it up and put it on the wall of the Battery Day Room for the benefit of the men of this organization.

M/Sgt. George C. Gutshall
1st Field Artillery Bn.
31st Artillery, APO 7

The photo is obtainable from the American Museum Of Natural History, Central Park West and 79th St., New York 24, N. Y. In our old outfit if you blew up a moon picture and put it in the day room, the men would have blown up the day room.

● *Hey, World*

All you amateur electronic organ builders: got any old, broken-down plans for a two manual organ?

R. F. Tully
43 Ridge Ave.
Bloomfield, N. J.

I am a boy of 15 who would like to have a pen pal anywhere in the world via MECHANIX ILLUSTRATED, regardless of race or age. My hobbies are stamps, flying saucers, guns and postcards.

Vidar Andersen
Nittedal St.
Pr. Oslo
Norway

Send the plans for broken-down organs direct to Mr. Tully—not to MI. If any 98-year-old Aztec stamp collectors are reading this, we'll bet our young Viking would like to get a letter from you.

● *Ozone Generator Tube*

While waiting in my doctor's office I picked up an old copy of your magazine (what other kind do you find in a doctor's office?) and ran across an article on how to make an ozone generator. A very simple circuit, merely a 40w ballast tube, switch and a G 4S11 tube in series. But on trying to get the G 4S11 tube I was met with "Ain't never heard of that one." Both at the dealer's and the wholesaler's. Can you get me some information on that tube?

J. T. W.
Levittown, N. Y.

The tube is the Sylvania G 4S11 Ozone-Producing Lamp. Try Sylvania Electric Products, Inc., 1740 Broadway, New York, N. Y.

● *Glass Fiber Kayak*

I found the articles Sock Boat and Build Skimabout in the Feb. MI of much interest on one point—the use of glass fiber for the

[*Continued on page* 18]

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Dear Editor

[*Continued from page* 16]

hull. However, I am interested in smaller boats such as canoes and kayaks. (I built your Canvasback last summer and a plywood kayak several years ago.) I am not happy with the prospect of painted canvas over a wood hull, while glass fiber on a wood hull appears heavy and still allows deterioration of the wood. How about an article on hulls alone?

W. K. Allen
North Plainfield, N. J.

We feel that manufacturer's instructions on the application of glass fiber are so complete that there is no need for us to run an article about the process. Your experience in building kayaks should make you self-confident enough to try adapting existing plans to glass fiber. You could build a cheap pine frame and plank with thin plywood or veneer and cover with glass fiber inside and out, or you could try substitutes for the wooden planking.

● *Rare Book Advice*

Please advise me where I can get information about old and valuable books.

D. R. R.
Worthington, Ky.

The Rare Book Room, New York Public Library, 42nd St. and Fifth Ave., New York, N. Y., answers questions about old and rare volumes. They won't set a price on your book for you but will look up the publication on book auction records and tell what it has sold for in the past. They will also give you names of antiquarian booksellers. The public libraries do a great job on things like that without regard for how pointless, ridiculous or nutty the question is. Very few people who use the libraries ever give them any money, although public libraries need money badly. Why don't some of you readers send your library a check—today?

● *Coin Albums*

I wonder if you folks ever published an article on how to mount coins for a collection?

Bill Fisk
Chico, Calif.

No. The best way, however, is to mount them in a coin album such as those put out by The Coin and Currency Institute of America, 134 West 32nd St., New York 1, N. Y., and sold in most coin shops.

• *Sorry*

Please send me some gadget paper for idea or inventor. Maybe is good for garden or garden flowers. It is easy to do with old scrap. Will you?

W. H. N.
Decatur, Ala.

No. You know why? Because we don't know wotinell you're talking about.

• *Quicksilver Unit*

Could you tell me what a quicksilver unit is as I intended to build a racing boat.

Wayne Roberts
New Bedford, Mass.

P.S. I'm only 13.

A Quicksilver unit is a racing lower unit made by Kiekhaefer Corp., Fond du Lac, Wis., for their Mercury outboards. It has less drag and a faster prop. Don't worry about being 13. If you're lucky, by this time next year you'll be 14. •

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Invention Clinic

Joseph H. Kraus

In this column each month Mr. Kraus will answer as many letters as space permits on those subjects he feels to be of widest general interest. Time does not allow him to reply to any letters except those printed here. Address your questions to the Invention Clinic, *Mechanix Illustrated*, 67 West 44 St., New York 36, N. Y.

Adjustable Fan Belt

William Ryder of Burt, Mich., has invented a fan belt which adjusts to fit any model of auto and truck. It can be installed in five seconds. He has been advised to make and sell the article by mail order. Will it sell? Does it have a good market?

First you should determine if you have anything which is patentable here. You could be infringing on some other patent which could get you into trouble if you made and sold the article. If it is as good as you claim you should consider patenting it. You could increase your sales potential by including auto supply stores, electrical shops, home and industrial workshops, washing machine repair shops and other places where fan belts are sold. Market potential should be good if the belt performs well and has a long life.

Compensating Bending Level

E. G. Levengood of Meyerstown, Pa., has designed a level which makes it possible to make accurate bends in electrical conduit regardless of the slope of the surface. Can a patent be issued for this device?

This appears to meet patent requirements. However, as many compensating levels have been patented, a thorough search is in order. We think the item is salable to those who find it irksome to make accurate bends in conduit and don't want to go to the expense of a bending machine.

Gum Moistener For Envelopes

Edward Maher of St. Johns, Newfoundland, Canada, sends sketches and a description of an envelope gum moistener which also serves as a desk ornament. Would any manufacturer be interested in purchasing the idea?

You have merely designed a stand for a popular commercial type of envelope gum moistener. It is doubtful if you could patent the stand. Even if you could, there are dozens of ways to duplicate the effect without infringing on any claims which you might be allowed. It is also doubtful that any firm would want to negotiate for non-exclusive manufacturing rights. Your one chance would be to make and sell the item, preferably making it appear more like the article it is intended to show in model form. There is no advantage in making the stand separately. This could become a novelty product with short-time sales potential.

Patenting Problems

Felix S. Balkin of Bronx, N. Y., has designed an article which is so simple that he could make the drawings himself. He does not yet know what types of materials to use. How does he apply for a patent? Is a search necessary? Is a search required if and when

[*Continued on page 22*]

INVENTORS' TIP OF THE MONTH

Good, workable fog lights or an indicator which will show the road conditions ahead on a dashboard screen or some other instrument would be of great value to motorists who drive through foggy country. There are techniques now in use which would permit such devices to be perfected. Someone should develop them for auto use.

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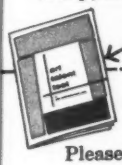

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BORDEN'S PRODUCTS FOR THE HOME HANDYMAN

Invention Clinic

[*Continued from page 20*]

the article is to be manufactured and sold?

You should hire a patent attorney to file your application. Generally speaking, the materials you propose to use have no bearing on your invention or claims unless they have a very special purpose. However, you could apply for a patent yourself by following the instructions which the U. S. Patent Office will send you. Failure to make a thorough search may cost you considerable money. After your patent is granted a search is no longer needed either for the sale of the invention nor for the sale of the article itself.

Combination

Joseph E. Pochered of Levittown, Pa., has designed a combination toaster and frankfurter cooker. Would any of the large appliance manufacturers be interested?

As you have given no construction details, our answer must be No. Combination baking ovens, toasters and frying pans or egg poachers have appeared on the market. These perform three or four functions at once. On the other hand, you may have a marketable item. But no large manufacturer will discuss purchase of your idea unless you have a patent. On the basis of the sparse information given, we would not recommend applying for a patent on this article.

Broom

Daniel Maloney of Lancaster, N. Y., has designed a broom which he feels will make sweeping easier and relatively dust-free. What are its potentials?

There is nothing to support your theory that this broom would be easier to use or

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materially hold down the dust. The household carpet sweeper would do a better job. We doubt that you can do anything with this device.

Lint Filter For Washing Machines

Stanley Lustik of Eveleth, Minn., sends diagrams and a description of a lint filter for use with suds saver washing machines. Is this patentable? Does it have commercial possibilities?

You may have a problem obtaining a patent for this device. We feel you should have a complete search made to give you an idea of what similar devices exist. If this item were on the market now we imagine that it would sell reasonably well. How true this will be three or five years hence is another matter. By then nearly all machines will have lint traps. Can you afford this kind of a gamble?

Wagon Handle—Duplex Camera

Robert F. Lunger of Bay City, Mich., has designed a telescoping handle for wagons and also is working on a dual purpose camera. What is the possibility for patenting and manufacturing.

There is nothing new to your telescoping handle. The trouble with these handles when applied to a wagon is that a slight dent or kink makes them inoperable. Your camera design is the better of the two. It is less bulky, easier to load with film and less likely to break down internally. However, inventors have found it difficult to sell camera inventions. Today, devices are available which allow films to be changed merely by replacing the camera back. Look into these things before you risk a considerable amount of money.

Toy TV Set

R. F. Schaffer of Davenport, Iowa, has been considering an idea for a toy TV set. Should he get in touch with toy manufacturers? Should he apply for a patent?

Dozens of readers of this column have come up with similar suggestions during the past few years. The idea has been used in everything from box-top cutouts to penny-in-the-slot "movies" with sound. Unless you can manufacture and sell the article yourself we recommend that you forget it.

Garbage Can Insecticide

James A. Brown of Mount Clemens, Mich., has designed a system for putting insecticide into garbage cans. Do we think it would work? If so, how should he market it?

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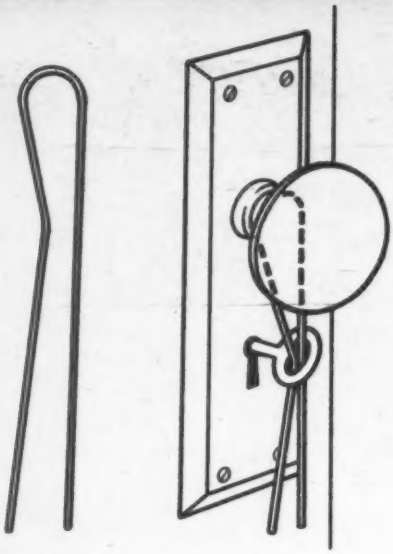
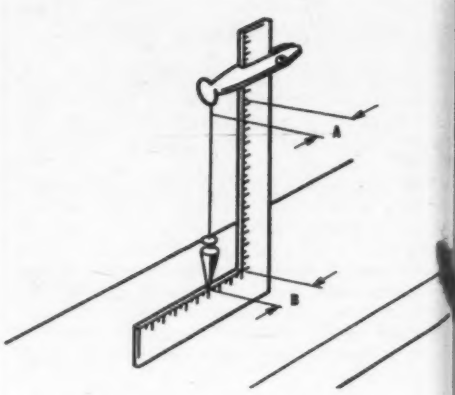
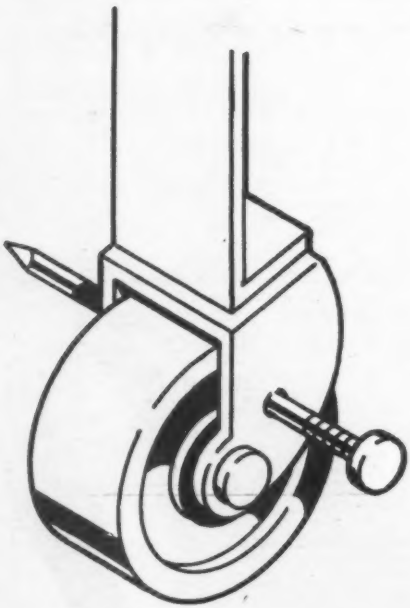


WIRE cut from coat hanger and installed as shown will prevent would-be thief from pushing door key out of hole from outside.



LEVELING can be done with a square if clothespin, string and plumb bob are set up so that distances A and B are equal.



CREEPING of caster-equipped power tool stands can be stopped by drilling a hole through yoke and wheel and inserting nail.

RUSTY SCREW can be removed by heating with a soldering iron. Expansion followed by contraction on cooling breaks the bond.

Invention Clinic

[*Continued from page* 25]

Your system can be made to work after you take some of the kinks out of it. But there are many ways to obtain better results. As to selling it, you first must learn if there is a potential market. I know of no one who has trouble with flies or other insects breeding in a covered home garbage can. Outside cans do not allow flies to breed if they are kept covered. And people do not keep garbage for the length of time most insects need to breed. The potential for a market is negligible.

Electric Lock

Dean Albright of Seattle, Wash., has developed an electric combination lock for home or business use. What do I suggest?

Forget it. Many youngsters during my early days fooled around with all kinds of electric combination locks. Who uses them now?

Emergency Stop Signal—Cabinet Mirror

W. G. Parks of Sissonville, W. Va., has not yet applied for patents on either of two devices, one of which is to produce a yellow flashing signal actuated by a quick stop, and the other is a modification of the mirror door for the medicine cabinet. Is either of these ideas any good?

A similar flashing signal has been marketed and found both wanting and illegal in some states. The modification for the mirror may become a worthwhile idea provided that you can design the construction so that it will be the best possible and would be considered a justifiable expense by both the manufacturer and the customer. Your patent could not blanket all possible constructions. Best would be a device which might be inserted into present pin hinges. After you have completed the design—and we recommend a working model, too—I advise you to have a patent search made.

Warning and Extension Light

Louis Halpert of Brooklyn, N. Y., sends a copy of his recent patent for a light which normally serves as a trunk light but may be used as an extension and warning light. Where can he find companies that might be interested?

First, you must say whether you intend to

[*Continued on next page*]

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sell the patent outright, or to make a royalty arrangement. Then you should be prepared to show a model. Your best bet is to visit the library in New York and look through some of the auto trade magazines.

Door Latch

C. O. Westover of Orlando, Fla., sends a photoprint of a door latch, to be placed beyond the reach of small children. He has written to 75 companies and received 12 replies. "What is cooking with them in rejecting it?"

I am surprised that you received so many replies. Forget this design and study some modern latches.

Nautical Clock

W. C. Zecchini of Farmingdale, N. Y., sends a photograph of a nautical clock on which he has a patent pending. He will not sell his patent outright. What reasonable royalty should he ask when dealing with a manufacturer? Would he get a larger royalty if the device were made in Japan?

I know of no Japanese manufacturer who will produce this item on a royalty basis. Dollars are hard to come by in Japan. However, if you can finance an order, and especially if you can pay for the dies, it is possible that you could have the job done in Japan for less than it would cost in the U. S.

As royalty is usually a percentage deal, you would get less per item because the article could be sold at a smaller cost. But you may gross more because sales might be greater. You might also give some thought to making this so that all parts are fully workable. That would make it an especially good conversation piece. Discarded sextants might be used. Depending on production, cost, distribution, minimum guarantee, and other factors, your royalty might be from five per cent to 12½ per cent. Make sure to have your own attorney examine any agreement.

Threshold Assembly

Phillip O. Howe of Pontiac, Mich., sends a copy of a drawing on which he has applied for a patent. The device will make it easy to install metal thresholds by first setting the anchor plate in wet cement, then drilling for the threshold. How can he sell it?

You are introducing a time-saving device in an area where union regulations might upset your hopes. I recommend that you try to get some reaction from any of the larger companies making thresholds. There are 55 in the U. S. The one nearest you probably is the Kawneer Company, Niles, Mich. •

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The average number of wing vibrations a second for mosquitoes is somewhere between 160 and 190, the wing muscles comprising 16.5 to 18.7 per cent of the total weight.

The U. S. Navy has used underwater TV equipment in ocean-bottom surveys at depths of more than 600 feet.

There are just as many rats as people in the U. S.

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Hoover Dam, the 726-foot-high structure on the Colorado River, is still the highest dam in the Western Hemisphere 25 years after its construction.

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Canada's second nuclear research center, to be known as Whiteshell Nuclear Research Establishment, will occupy 11,000 acres of land 60 miles from Winnipeg.

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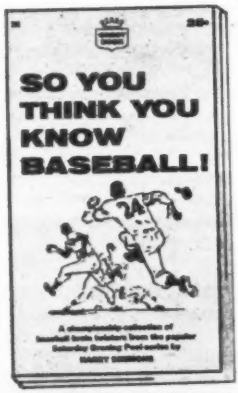

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PATENTS GRANTED

DEW enthusiasts will like the dew meter for measuring and recording the duration of time that moisture from dew or rain is present on a surface. Carlton F. Taylor of University Park, Pa. got patent 2,924,498 for his dew meter.

An artificial tooth that Los Angeles inventor Jacob A. Saffir claims looks, feels and sounds like a natural chopper won him patent 2,920,390. The translucent tooth has a hollow core filled with a liquid that alters the resonance or sound effects of the tooth, thereby quieting false teeth noises, including much of the objectionable clicking.

Canned, frozen and dehydrated foods may be made to taste like fresh foods by a new flavor-enhancing method that uses flavor enzymes obtained from bruised fruit and other food wastes. Patent 2,924,521 was granted to Evans Research and Development Corp. of New York.

An "illuminated jig-saw puzzle" with a built-in electrical circuit has a lamp on its face that lights up when all the puzzle pieces are properly put together. Inventors Toby Blackman and Joan Chapman of Chicago, Ill. won patent 2,923,550 for the enlightening device.

A deadly nail with sealed-in termite poison took patent 2,923,039 for Robert E. Imus of Sierra Madre, Calif. The nail is so constructed that the poison is not released until the nail is driven well into the wood. The wood immediately surrounding the nail then becomes poisonous to termites and other woodboring insects.

Junzo Kashiyama of Tsukaguchi, Amagasakishi, Japan, got patent 2,919,443 for a photographer's jacket incorporating a built-in light-proof bag. The jacket is designed to enable its wearer to change film or perform other operations requiring light-free surroundings without going into a darkroom.

Good for the morning after you fell down the stairs is a tie-on ice or hot water bag big enough to hold three ice cubes. Patent 2,919,735 was granted to inventor Leona E. Prietzsch of Venetia, Pa., for the bag which is made of a non-sweating material to prevent moisture from forming around the point of contact. •

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BANANAS from Alaska and grapefruit from Siberia may soon be on grocery shelves. The discovery by Westinghouse scientists of a narrow band of rays in light from incandescent bulbs and fluorescent lamps responsible for most plant growth, may be the key to growing tropical fruits in cold climates and even on future underground farms.

Scientists at the Israel Institute of Technology in Haifa claim that the blue, red and orange sands of the Negev Desert can be mixed into cement blocks, concrete, plaster and non-slip floor and roof tiles to tint the final product. The permanent color eliminates painting, and surface scratches and nicks barely show.

Electromagnetism may be used to stimulate the conscious human brain, produce mental, emotional and hormonal responses, and to stimulate nerves, muscles and other irritable tissues, according to Dr. Alexander Kolin and Dr. Norman Q. Brill, assisted by Paul Broberg of the University of California Medical School at Los Angeles.

Sunglasses that are so light sensitive that they will automatically adjust to the amount of brightness indoors or outdoors are now being developed by the National Cash Register Co. for the U.S. space program and consumer use.

Telepuppets, remotely controlled machines with hand-like parts and TV eyes, may build the first platforms in space, according to Dr. Fred L. Whipple of the Smithsonian Institution's Astrophysical Observatory, Cambridge, Mass.

Passenger and cargo submarines that could speed across oceans at fantastic speeds may result from a new rubber coating developed by Coleman-Kramer, Inc. of Los Angeles and the U.S. Rubber Co. The new surface is said to reduce water turbulence around a body moving through the water and, with coming engine improvements, could lead to speeds above 200 mph for future submersibles.

English doctor Alick Isaacs, discoverer of a new cold and virus killer, interferon, foresees the day when local infections such as colds that settle in the head, eyes or throat could be swabbed or sprayed away with the agent.

Some day radar stations in London and New York may watch every commercial airliner every minute as they span the oceans. That is one possible future application of an experimental radar conceived by Dr. Robert M. Page, director of the Naval Research Laboratory where the new device is being tested.

An instrument that may distinguish between oil and water and that can give the underground location of petroleum deposits is on the threshold of perfection, according to scientists at Standard Oil Company of California. The instrument, called the Nuclear Magnetism Log, is housed in a tubular casing and lowered into a well on a long wire cable.

Uncle Sam plans to launch a satellite in the heavyweight class in the fall of this year. The satellite will have a telescope for scanning the heavens and the complete assembly will weigh about 3,500 pounds. The 36-inch telescope will weigh approximately 500 pounds. The satellite is expected to orbit the earth about once every 100 minutes for a year, 500 miles out in space.

A new man-made material that can be molded, melted and milled like a plastic, but is also rubbery, making it suitable for use in shoe soles, floor tiles and coverings for cables and golf balls, is being developed by the Phillips Petroleum Co. of Bartlesville, Okla.

A plan to link the entire British Commonwealth by undersea cables which will carry "piped" TV as well as telephone calls was recently revealed. The project is expected to take ten years. Cost of the global link is estimated at between $200,000,000 and $230,000,000. The TV pictures carried in the cables will not be live but delayed TV. The pictures will be relayed immediately after the event but it will take about two hours to transmit them.

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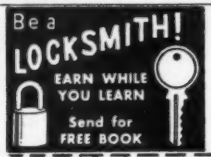

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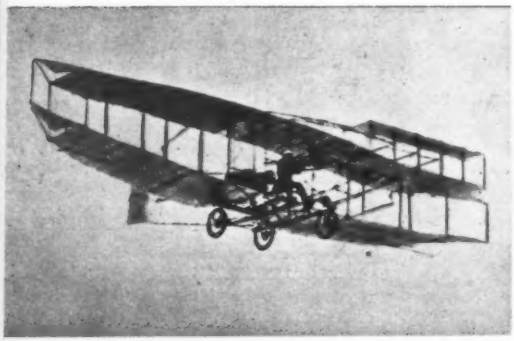

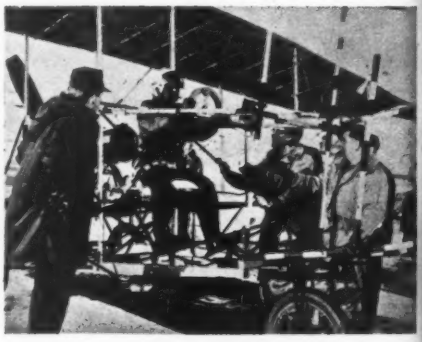

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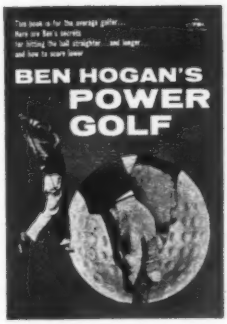

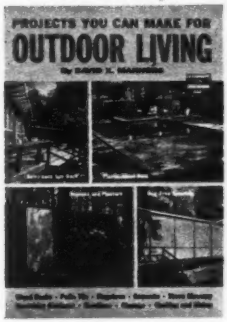

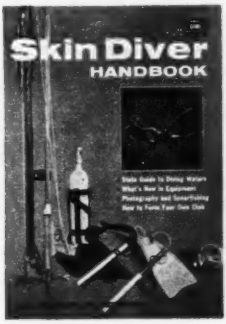

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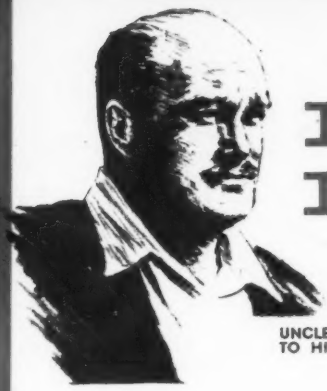

MAIL FOR McCAHILL

UNCLE TOM ANSWERS HIS MOST INTERESTING LETTERS IN THIS COLUMN. WRITE TO HIM AT *MECHANIX ILLUSTRATED*, 67 WEST 44TH ST., NEW YORK 36, N. Y.

● *I am an 18-year-old senior in high school and was wondering if you could answer a few questions about stock car driving. First, how does one get to be a driver, and how does he get a car? Second, what are the advantages of racing? The last thing I want to know is what is the yearly salary of the average NASCAR driver?*

Kent Backstrom
Minneapolis, Minn.

Working from the bottom up—NASCAR drivers, to the best of my knowledge, receive no salary but some have made more than $50,000 in prize money in a single year. There are no advantages to racing that I know of, aside from the occasional fresh air you might inhale when leading. As to how one gets to be a driver and latch onto a car, I feel the answer is pretty obvious. First, to be a driver, being nuts is a big help. The cars can be obtained in the usual way—stealing or buying.

● *To heck with this gas mileage stuff. It doesn't amount to enough to bother with—whether your car gets 15 or 18 mpg. I say if you have to care this close, go by bus.*

Syd Grant
Newark, N. J.

It's a cinch that you don't own a boat, Syd. My boat The Rooster at full cruising speeds on her way south or north, can gulp down 200 gallons of gas in a day without half trying. A little economy here would be very welcome.

● *You are a doll—look just like my hubby.*

Pat McGehee
Torrance, Calif.

Just looked up "doll" in the dictionary and I guess you're right. Webster says a doll is "a pretty but empty-headed person."

● *I have been trying to find a copy of your book, How To Cheat For Fun And Profit, for my husband. Now I am wondering, how many books have you written, what are their names and how can I go about acquiring the complete works?*

Rosemary L. Alley
Willimantic, Conn.

Glad you asked, Rosemary. I've written two books for Fawcett Publications and two books for Prentice-Hall. My latest is Today's Sports And Competition Cars (at any good bookstore). I believe Arco Publishing in New York still sells Tom McCahill Car Owner's Handbook in hardback edition. How To Cheat For Fun And Profit is a chapter in Today's Sports And Competition Cars.

● *Say, what's going to happen when this car that rides on an air cushion tries to cross Court Street Bridge in Woonsocket, R. I.? Two hundred yards long and four lanes wide, it's all open steel grill.*

O. J. Ducherme
Pascoag, R. I.

When such obstacles are encountered, the driver of an air cushion car may elect to ignore the bridge and cross on the water—something it reportedly can do on a calm surface. What a spot to run out of gas on a January night!

● *A couple of years ago in your column I read your statement that alcohol used with the gas occasionally would perform the same task of eliminating water and condensation in the gas as would the commercial preparations available at gas stations. Will you kindly tell me which alcohol this is, and if it must be combined with some other ingredient?*

Paul Knox, Jr.
Albany, N. Y.

I just use any handy alky not contaminated by water. In fact, in a pinch I've used alcohol anti-freeze. It worked just great but this is not a recommended procedure, as most anti-freezes have inhibitors in them which might

[*Continued on next page*]

Tom McCahill Reports on:

Heavier, More Durable Muffler Construction

You hear a lot of bellowing from car owners about how often mufflers have to be replaced on modern cars, and they have some grounds for beefing, for the typical muffler only lasts 6 to 18 months. Mufflers are pretty perishable items today, due to stepped-up compression ratios, higher horsepower, and high-octane fuels.

The thing to look for in buying is thicker, heavier coated steel. Even this will wear out, but it takes longer than the thin-skins. You don't have to have a sheepskin from M.I.T. to figure out that thicker steel will take longer to rust through. This is only one indication of muffler quality, but an important one. Oddly enough, cars run only occasionally for short distances use up mufflers twice as fast as police cars and trucks under constant use, because the harder-working mufflers dry out the corrosive condensate that continually eats away the shell. All mufflers rust from the inside—not the outside.

Next time you need a replacement, look up your AP dealer. AP mufflers have much thicker shells and heads than other brands. Heft them, and you'll feel the difference. AP mufflers weigh several pounds more than would-be rivals. Tie this up with rust-resistant coatings and with their exclusive "Dri-Flow" design, which keeps AP soundbusters drier inside, and your muffler problems will be over for a long time—and they don't cost a dime more than ordinary thin-skinned jobs.

It's easy to find the nearest AP dealer. As the largest manufacturer of replacement mufflers in the world, AP has more than 100,000 dealers from coast to coast. Just look for the red and white AP "Free Muffler Check" sign.

FREE MUFFLER CHECK WE INSTALL AP MUFFLERS AND PIPES

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prove harmful to the car's insides.

● *If the trunk of the Corvair "took McMichael right up to the neck" (Nov. 1959 MI), he entered head first—right?*

George Gale
Panama City, Fla.

Jim often exits head first but rarely ever enters that way. This is especially true in Western saloons.

● *Could you furnish me with information or booklets concerning your smallest Italian scooter?*

B.L.
Louisville, Ky.

Herman Garibaldi, a four-foot-one Genoese arsonist and smuggler, is the smallest Italian scooter we've met.

● *A large majority of dealers and factory road men I have talked to say that cars are built so well nowadays there is no need whatever for a break-in period. Parts are made so perfectly and so well-assembled that you can "break 'em in fast and they'll run fast." I just don't believe it. Is the Tender Loving Care of the McCahill Method no longer good practice? Am I an old fogey for believing that any piece of machinery—from a Tinker-Toy to a Rolls-Royce—will be better off for having its parts get acquainted gradually? Please set me right.*

O. V. Keadle
Marked Tree, Ark.

O.V., there are two ways to break in cars—the other guy's and yours. When the car belongs to me, I break it in like that mythical Old-Maid Schoolteacher you always hear about. All new parts are subjected to heat expansion and they can either be worn in smoothly or gouged in. As they get warmer tolerances are reduced many times and you could easily do damage that might not show up until thousands of miles later. If an engine "doesn't have to be broken in" when it's built then you can be assured of one thing—it was a lousily-built to start with. And don't forget the engine isn't the only part—the rear axle assembly, transmission and even the wheel bearings will be a lot better off if you go gently until they can take a "natural set."

● *Some of the safety campaigns ought to work on getting the cops out from behind the billboards and on the roads and streets where they can promote safety instead of revenue.*

A. T. Stonehouse
San Diego, Calif.

Maybe many cops hide behind billboards because they feel safer there.

[*Continued on page* 48]

"WALKING" SUSPENSION

One of the most intriguing—and rewarding—features of Chevrolet's revolutionary Corvair is its superbly smooth, supple ride. The reason for it lies in a suspension system unique among U.S.-built compact cars: independent suspension at all four wheels.

Here's how it works: each wheel on a Corvair rests on its own deep coil spring, which absorbs road shocks independently of the other wheels. Say, for example, that you're cruising along a choppy dirt road and your left rear tire suddenly sinks into a rut. In any other U.S. compact car, the *right* rear wheel would react as violently as the left to that jolt—which is only natural, since both rear wheels are locked together on a single axle. But in a Corvair, the wheels are divorced from each other, so you virtually "walk" over the ruts.

This "walking" suspension helps keep your Corvair glued firmly on the pavement for extra traction and control on slippery roads. What's more, those resilient coil springs won't squeak,

which means a quieter ride. And Corvair's independent suspension cushions the car's overall weight for a soft, comfortable way of going.

This 4-wheel independent suspension is, of course, a tremendously important advance in the design of compact cars. A five-minute turn at the wheel will show you just how important. The man to see is your Chevrolet dealer—and there's no better time than now. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Technically speaking, Corvair is probably the most fascinating car to come down the U.S. pike in the past 49 years. Here are some of the engineering advances you'll find: an air-cooled "pancake" six engine, mounted in the rear . . . unit construction . . . an amazing unit combining engine and transmission in one compact package.

corvair
BY CHEVROLET

[Continued from page 46]

● *I share your interest in speed and acceleration. I am the owner of the Unlimited Hydro "Miss Tri-Cities" which Henry Kaiser built as the "Scooter Too." If you want to experience the ultimate in speed and really have the hair stand up on the back of your neck, come on out and have a ride! It gets from 80 mph to 150 mph in seven seconds! Goes into turns at 120 mph-plus. There is nothing like it.*

George H. Gilham
Hermiston, Ore.

You can see what happened to the hair on my head, George—let's leave the back of my neck alone.

● *In the compact car race at Sebring, a Studebaker Lark finished second and I read somewhere that it did better than 120 mph. Was this car stock?*

Herb Stole
Grand Rapids, Mich.

Knowing the men who set it up and drove it, I'd say it was just about as showroom stock as a mouse with webbed feet. The same goes for several other compact cars in that race which resembled their production line brothers just about as closely as I resemble the late Mahatma Gandhi, exposed ribs and all.

● *Recently I got my 1959 car stuck in some light mud just off my driveway and couldn't get it out. The man who delivers our groceries arrived in his truck and we found an old chain in the garage. I couldn't find a single place on my car to attach a towline without interfering with the bumper. So I carefully wrapped some rags around the bumper and attached the chain to it. The truck pulled me out, all right, but the bumper was completely pulled out of shape. I just found out from my dealer that if I have it straightened it will still look very bad and a new one will cost me better than $40. I, for one, think it is pretty silly to build a car that you can't even tow. What's behind this kind of thinking? I understand all makes of American cars have the same fault.*

Edgar T. Crane
Boston, Mass.

Possibly the thought behind this kind of car-making is the sale of more bumpers. If this isn't the case, then all American manu-

[Continued on page 50]

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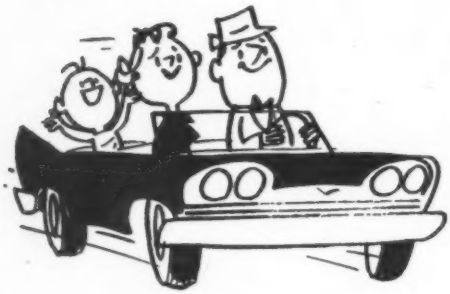

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Cleveland 15, Ohio

Mail For McCahill

[*Continued from page* 48]

facturers must be worse egomaniacs than w suspected. Every one of their cars will usuall need a tow of some sort during its normal lif and there should be some spot where a tow line can be attached without causing majo damage to the tinsel decorations.

● *Would having a three-year-old car re painted pay me.*

A. R. George
Montreal, Quebe

Don't know where you could get a cent fo it.

● *In some cities it's against the law to drive a car with a drunken person, even if he is only a passenger. If this is true, what are you supposed to do when you get a phone call asking you to pick up a slightly inebriated friend and drive him home?*

Paul Holmes
Los Angeles, Cali

Well, you could let your drunken frien drive so *he* gets the rap. Or call a cab and le the hackie get it. Personally, I recommend giving him a few more drinks until he's thoroughly plastered and then shipping him hom via Railway Express as a "Perishable Item."

● *Recently I hit a pheasant with my car and killed it. Rather than have it wasted I got out and picked it up, and the next night we had it for dinner (it was delicious). Here's the hitch. When I told some stuffy friends about it, they seemed horrified and said that since I didn't have a hunting license and it was out of season, I was duty-bound to turn it over to the game warden. Do you think I did right, or wrong?*

Name withheld on reques
Cairo, Ill.

In most states I know of, if you kill any game accidentally, especially big parcels such as a deer, you're supposed to leave it there and notify the game warden. I guess this goes under the same theory that it's not cricket to pick the pocket of any pedestrian you might nail. However, what you did with the pheasant just makes good horse sense to me.

● *What way do you recommend that I go to Las Vegas from Boston?*

Jack T.
Brockton, Mass.

Loaded, and alone.

[*Continued on page* 52]

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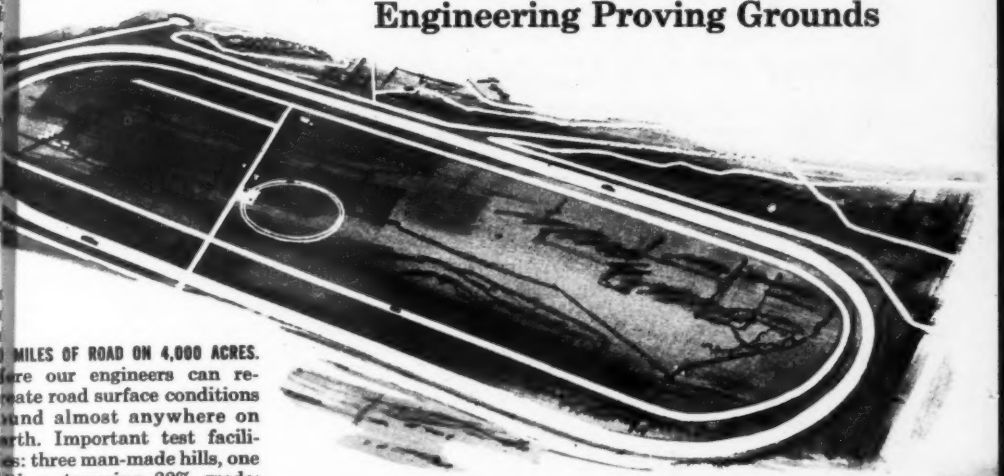
Around the world in 41 miles

The story of the Chrysler Engineering Proving Grounds



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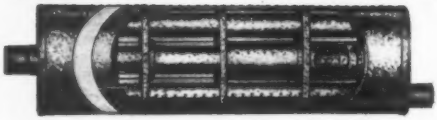

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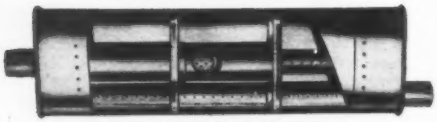

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Standard A proud new economy version of Silentone. Though priced for the thrifty, this is no tinny makeshift. It is a heavy, durable muffler, the equal of most higher priced mufflers on the market. That's why we call it Standard.

For a fine glass-packed muffler with a unique quiet power tone, ask about Dynatone—now custom engineered for your car.

Sold only by America's leading automotive chain stores

SILENTONE MUFFLERS

Dept. 3E Toledo 1, Ohio

Mail For McCahill

[*Continued from page 50*]

● *My gas tank does not have any water in it.*

Rutger Osterroth
Fitchburg, Mass.

Glad to hear it.

● *A recent MI published what is probably the most terrific letter in the history of journalism. I refer to the one where your answer begins: "The bare truth, Jack, is that better than 90 per cent of American car buyers wouldn't know a good car if they drove one. . ." It is refreshing to see someone so well qualified, who has the entrails to come right out and say what he means without decking it in lace-trimmed underwear. By your forthrightness you have made a lot of friends and, I suppose, some enemies. Keep it up, though, and let the quips fall where they may.*

E. D. Nunn, President
Northern Signal Co., Inc.
Saukville, Wis.

Thanks a lot, E.D. You can rely on getting all my signal business in the future.

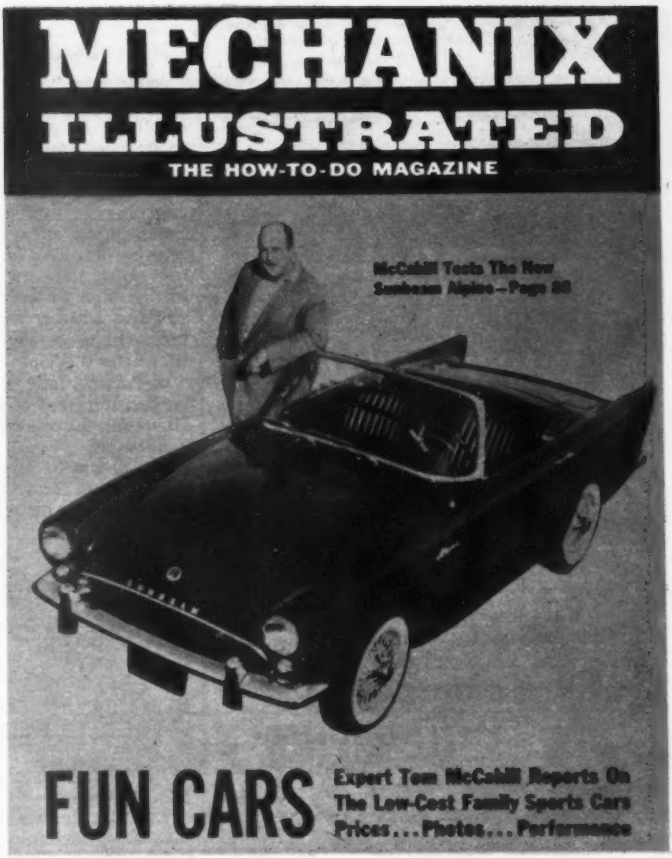
● *A pal of mine pulled a real goof the other day which could have cost me a lot of dough. For some time he's told me he knew all about automobiles, so when I suspected my fuel pump was getting weak he said he'd check it out for me. With the engine shut off, he disconnected the feed pipe leading from the fuel pump to the carburetor. He said he was going to see how far the pump could throw a stream of gas. He then told me to start the car. Somehow the stream of fuel that was pumped out hit a spark plug and grounded and* bang! *the whole engine was on fire.*

I must admit I lost my head for a second because it was some time before I thought to turn the engine off. It was running on the gas still in the carburetor and each time the pump belched a new shot of fuel it looked like a flame thrower. Fortunately, we got the fire out quick once I shut the engine off. Aside from one hose and all the wiring being badly burnt, there wasn't much damage except for a bad burn spot on the paint of the hood. I believe my insurance company is going to pay my claim without too much question. But what I want to know from you is, wasn't my friend nuts to check it this way?

S. R. Haas
Bridgeport, Conn.

[*Continued on page 54*]

Here's what Tom McCahill says about the new Sunbeam Alpine



"...a real dream bucket, one that seems to have everything at the right price. It should prove as popular as a gift certificate to Tiffany's and it ought to stay with us as an outstanding buy for some time to come... with a price tag of $2595, the new Alpine gives the buyer top looks, a lot of functional features and a real crisp 1½ liter performance. For an extra charge, a removable hardtop is available in addition to the soft top. The car also features wind-up windows, something you rarely find in a high performance bucket in this price range... the instruments are real instruments—items Detroit hasn't been able to afford in years. The upholstery on the two bucket seats is something the boys should take a look at: this is real upholstery ...the gearbox is as smooth as an oiled ear lobe. Steering is clean and fast without lag... It is one of those cars that comes along very seldom. Its looks are sharp, its personality is brimming over with swashbuckle. It's the best offering dollar for dollar..."

Sunbeam *Alpine* $2595 p.o.e. A Rootes Product

Western States Price Slightly Higher.

Rootes Motors, Inc., 505 Park Ave., N.Y., N.Y. • 9830 W. Pico Blvd., L.A., Cal. • Rootes Motors (Canada) Ltd., Toronto, Montreal, Vancouver

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P.O. BOX 603-E, DUNBAR, W. VA.

Mail For McCahill

[*Continued from page 52*]

First, yes, your friend was nuts to do with your car as the moment you turned th starter, the ignition also went on. About th insurance company—the chances are the would have paid for a total loss but they migh have asked some questions. If it was a re sharpie company they mightn't have paid, de pending on how their policy was writte Many frown on amateur work. Testing th fuel pump the way your friend did stems bac to the days when the ignition switch and th starting button were two entirely differe units. In those days (with care, to keep th fuel from the vicinity of the starting motor) was a fairly safe check, as the engine woul be turning over but the ignition would be of However, I once succeeded even under the conditions, years ago, in burning a truc right down to the ground while making similar test. The right way is to remove th pump and check it with a pressure gauge.

● *Where can I get a published list of a winners (cars, classes, drivers, etc.) fo Speed Weeks 1959? I'd appreciate any ad dress. P.S.: What exactly is a "rhubarb?"*

Allen Morris
Providence, R

Write Brad Willson at NASCAR, 42 Sout Peninsula Drive, Daytona Beach, Fla. Ac cording to Webster's Dictionary, a rhubarb i "a tall, coarse herb with very large leaves an thick, succulent petioles." In Ireland, the defi nition is "two guys in a saloon with thre bricks."

● *I read your article Ten Best Buys I Economy Cars in a recent issue of M and was very surprised, but pleased, to se two Scandinavian cars on the top. The Volv and Saab are very fine cars. I'm driving a Alfa-Romeo Guilietta Spyder in which w took a third prize at Boca Raton, Fla. in 195 I was also driving a Golden Hawk, super charged, and found that one to be a very goo American car. A perfect car for long travel We drove from Miami via New York an Paris all the way to Norway, "The Land o the Midnight Sun," in a Golden Hawk and ha no trouble whatsoever.*

Jan B. Bergendah
Tonsberg, Norway

Seaworthy little sonofagun, wasn't it?

—*Tom McCahill*

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Frank Gifford

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Formerly Sylflex

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TIRE FACTS THAT CAN SAVE YOUR LIFE

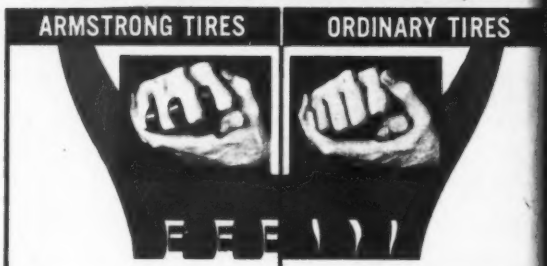
ONLY ARMSTRONG TIRES HAVE PATENTED INTERLOCKING SIPES

"SIPES" are the slots put in a tire's tread to give more gripping edges, to stop skidding. Armstrong's interlocking, S-shape siping (see magnified view at left) provides grip in ALL directions, gives you sharply improved protection against both forward and side skids.

AND UNLIKE tires which have sip just cut into the tread, Armstro siping is *molded* in, deeply. Long af the mileage that wears away the sh low siping of ordinary tires, Armstro siping continues to give you full p tection. Safeguard your car agai deadly skids . . . compare, and see h Armstrong gives you far more sip than other leading tires.

ONLY ARMSTRONG TIRES HAVE PATENTED SAFETY DISCS

—Grip the road to stop deadly skids as no other tires can!



TREAD STAYS OPEN

Like fist above with discs between fingers, tread CAN'T squeeze shut. Hundreds of Armstrong Safety Discs hold tread's gripping edges open, always ready to "bite."

TREAD CAN CLOSE

Without discs, tread CAN squeeze shut, like fist above. Tire's gripping edges are pushed together, lose their grip. Even brand new tires can go smooth like this . . . and you skid!

ARMSTRONG RUBBER COMPANY
Home Office, West Haven, Connecticut

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MECHANIX
ILLUSTRATED
May 1960

AMAZING NEW JET BOAT

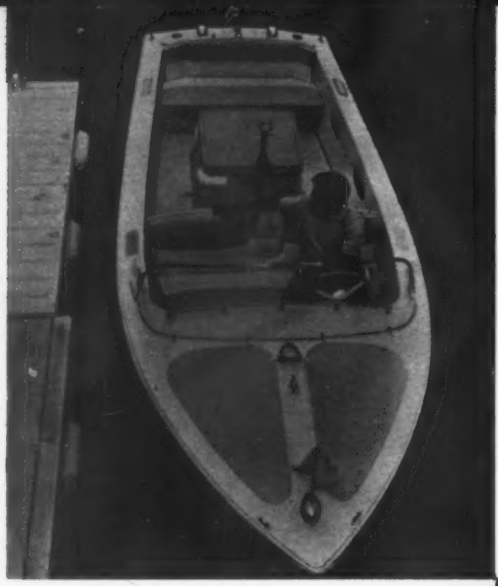
Water jet propulsion is secret of speeding through shallow water and whizzing harmlessly over logs and sand bars.

TURBOCRAFT is the name of an amazing new boat that can travel in two or three inches of water, turn around in its own length at top speed and ride over logs, sand bars and other debris without hull damage.

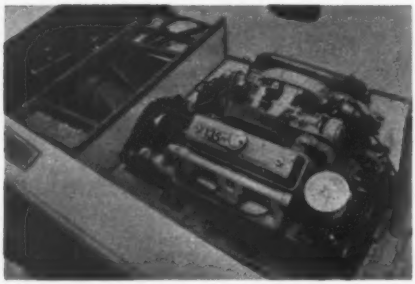
The craft, now being made by Indiana Gear Works, Inc. of Indianapolis, employs the principle of water jet propulsion. The Turbocraft's drive consists of a three-stage axial flow turbine powered by a lightweight, four-cycle, six-cylinder inboard marine engine developing 740 pounds of thrust. A grille flush with the bottom of the hull screens the intake. In operation, water is drawn from beneath the hull, driven through impellers and discharged at high velocity via a nozzle at the transom.

A simple device that operates two vertical deflector plates, one on each

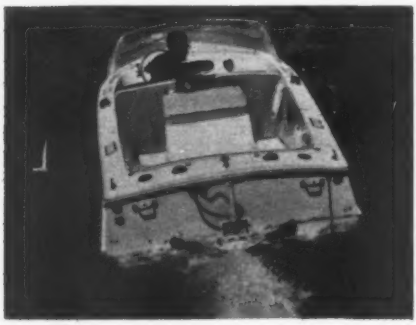
UNCONVENTIONAL Turbocraft hits 35 mph in water little more than ankle deep.



FIBER GLASS boat is 16 feet long. Its inboard engine is under square center seat.



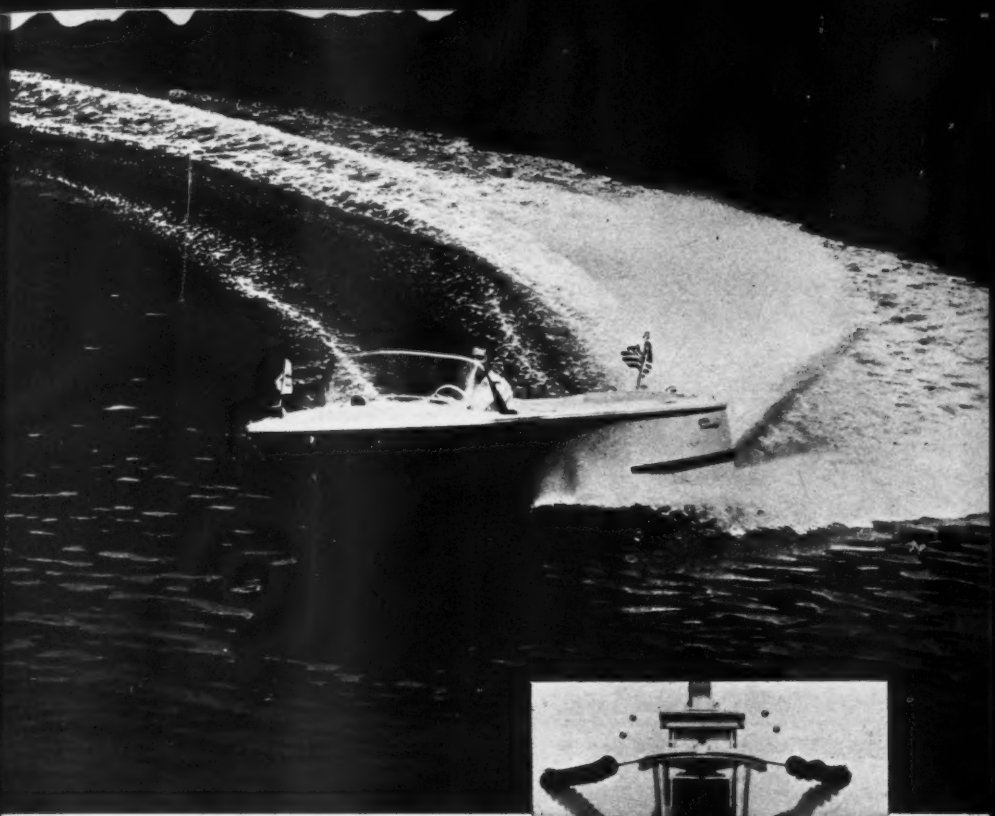
INBOARD engine develops 740 lbs. of thrust. Jet unit is shown tucked under aft seat.



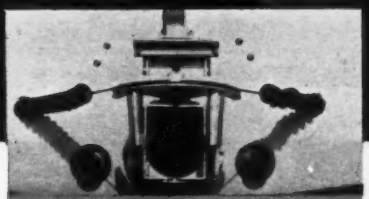
UNDERWAY. Turbocraft's power plant, jet unit provide instantaneous acceleration. Maneuverable craft rides high in the water.

CRAFT has an automobile-like steering wheel, dashboard, accelerat

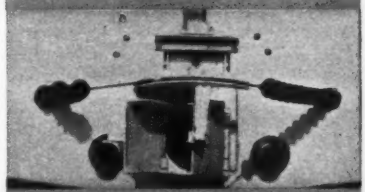
WATER sucked in grille (arrow) goes to impellers and is driven out of jet nozzle. Note lack of appendages under the hull.



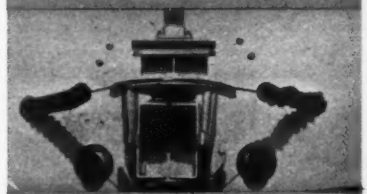
MANEUVERABLE Turbocraft can turn in its own length at top speed without adverse effects.



JET NOZZLE'S deflector plates are open for straight-line run.



DEFLECTOR plate is in position for sharp left-hand turn here.



REVERSE. Plate is dropped to deflect jet stream under hull.

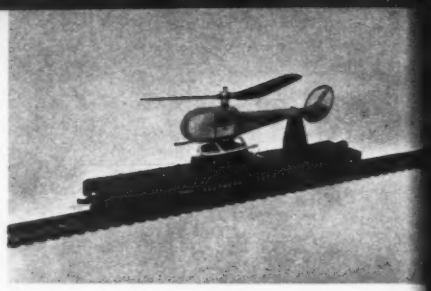
side of the jet stream outlet, controls steering. The direction of the thrust is deflected to turn or back up. The craft has no clutch, reduction gears or drive shaft through the hull. The jet unit provides instantaneous acceleration, according to the manufacturer.

The most unusual feature of this boat is that there are no appendages beneath the hull. The jet outlet and steering plates are located outside of the transom and are above the water line. This makes it ideal for use on shallow rivers, swamps and waters heretofore inaccessible to boats.

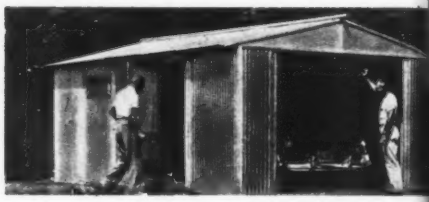
The novel 16-foot fiber glass boat was developed by C. W. F. Hamilton & Co., Ltd., of Christchurch, New Zealand, and the rights to build it in the U. S. have been acquired by Indiana Gear Works, Inc. The company is now in the process of developing additional models. The craft with its standard engine can do 35-40 mph and is listed at $3,365. •

Now See This!

REALISTIC SPACE HELMET of durable plastic has a real radio in it that lets Junior hear radio programs without annoying Pop. Earphones are in the hat, radio in belt; antenna extends to five feet. The radio can be played separately, too. The maker is Hearever Co., 2644 Castro Valley Blvd., Castro Valley, Calif. Price is $5.

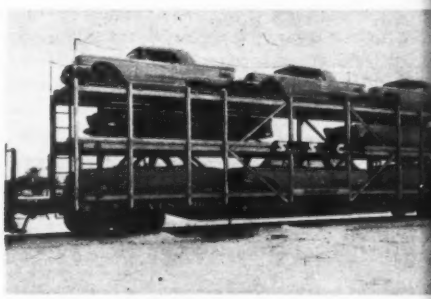


HELICOPTER LAUNCHER is one of latest additions to the Lionel line of HO operating cars. The copter is powered by spring action and soars into the air at the touch of a button. Price is $7.95. Other new equipment includes an ICBM car from which a missile can be launched to hit an exciting target—a boxcar that "explodes."



PORTABLE SHED, using Kaiser aluminum, can be used for a wide variety of purposes, domestic or industrial. Two men can put it up in one hour using only a ladder, a pair of pliers and a square level. It will probably sell for under $400. Under development by Magic Industries, 2855 Holt Rd., Indianapolis. Garage door available if desired.

RUST ERASER makes ladylike work of a job that has long been one of Daddy's little headaches. Developed by Buick, it has the feeling of pumice when dry, softens when wet. It cleans rust off chrome like wiping off a kitchen table, does several other jobs. Your Buick dealer handles it.

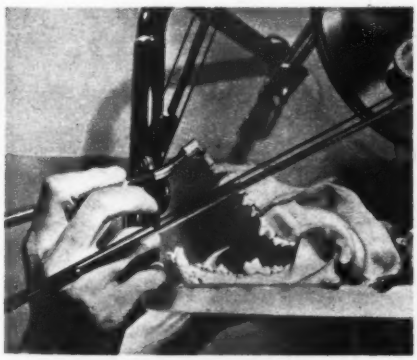


TRIPLE-DECK CAR CAR for carrying autos to market has been developed by the Santa Fe Railway. This one's loaded with Ford products. Car carries up to 15 cars. Load above is made up of three 'Birds, two Lincs, two Falcons and a Mercury wagon—just to show what a variety can be hauled.

THE MAN WITH 300 TEETH

DR. JOE DOUGHERTY of Lexington, Ky. is an oral surgeon with what might be called a biting hobby. He collects teeth and has about 300 in his collection. They are not ordinary choppers either. They are unusual human or animal teeth such as a pre-historic shark's tooth, elephant, monkey or horse teeth, etc. The doctor also discovered that teeth make wonderful Christmas tree ornaments. •

HOBBYIST Joe Dougherty displays some of his collection of animal and human choppers.



CLEANING UP. Dr. Dougherty keeps teeth sparkling with an occasional brushing up.

MONKEY skull gets its pearly whites examined before doctor repairs damaged ones.

CAMEL FUZZ order in code from American businessman goes to . . .

LANGUAGES made to order

By John L. Springer

. . . BAGHDAD agent who decodes cabled message and fills order.

THE president of a U. S. company recently went on a big-game hunt in Africa with an aide. A few weeks later the vice-president who was left in charge of the company received a mysterious two-word message signed by the president's companion.

"RNTAZ MSYDU," it read.

The vice-president took a book from his desk, consulted it for a moment and then telephoned his stock broker.

Translated, the simple code message read, "Associate died of a heart attack." The vice-president knew that a huge corporation had been dickering to take over his firm at a high price and that the company's president alone had objected. Now the merger would surely be made. By buying before the news became public and the stock spurted in price, the vice-president reaped a small fortune.

Secret messages are part of the fascinating, little-known business of code-making. In New York City a small group of men make big money creating dictionaries with words you never heard of—words like TYMDO, CLREF and HUKKA. Those words have secret meanings for the code-makers' customers who, like the shrewd vice-president, want to receive and send messages all over the world that only they and their associates can understand.

Take the word UYMTU. To one code-maker and his customers, this apparent typographical error really means "Chinese duck feathers No. 2." The letters PNAGO mean exactly "$1.98½." With two words, a firm can cable its representatives all over the world to buy Chinese duck feathers No. 2 at $1.98½ per pound —and its competitors will never know that the market is being cornered.

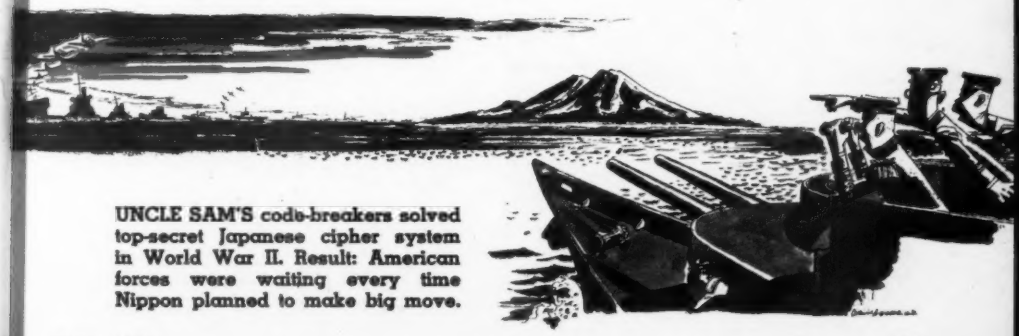
One top code-maker is William J. Mitchel of the Acme Code Co. Every word he creates takes the place of one to 40 standard words. His clients use the code not only to keep business dealings hush-hush from competitors and unfriendly governments but also to save more than 25 per cent on cable costs when sending communications.

Mitchel has devised private codes for corporations like U. S. Steel, Standard Oil (N. J.) and General Motors. One volume, as big as a dictionary and with 450,000 terms, was published for a cotton broker.

He also has compiled a public code, which anybody can use. It has 1,048 words dealing with offers alone, 880 words for price and prices, 103 terms for competitors, and code words covering every sum from one-sixteenth of a cent to $5,000,000. Forty-nine phrases deal only with varieties of desiccated cocoanut!

When you send a code message, you first consult the book to find terms which express your thoughts. The recipient consults his own book and translates the message from code back to English.

Sometimes businessmen receiving messages for the first time are thoroughly confused. A Belgian exporter heard that a Philadelphia scrap-dealer was in the market for steel bars. The Belgian cabled [*Continued on page* 159]



UNCLE SAM'S code-breakers solved top-secret Japanese cipher system in World War II. Result: American forces were waiting every time Nippon planned to make big move.

OUTDOORS with W. Scott Duncan

HOW TO FOLLOW THE LEADERS

AUTHOR ponders the tough problem of which leader to use. Selection of right one is important to fisherman.

MAY is the month that fresh water fishermen have been waiting for throughout the U.S. and Canada. Salmon, trout, walleyes, pickerel, northern pike and many panfish start hitting the bait as the waters warm up.

In some states bass are legal game at this time and are as hungry as starving wolves. All of these fine game fish can be taken on flies—streamers, wet flies or dry flies. And in spite of the present popularity of spinning, fly fishing for all game fish, both fresh and saltwater, is gaining rapidly because there is no more sporting way to take game fish.

The fly fisherman, however, has many problems to solve that the spincaster and the bait rod angler never face. For example, what flies to use today on this water? What rod and reel? What line? What leader? The line is the most important part of the fly angler's gear. If it isn't right, nothing is. Next in importance is the leader that goes between line and fly. If this isn't correct, the perfect line won't help much either.

The problem of which leader to use is a dilly. Ask any six anglers what leader to use on any given stream and you'll get six different answers. You can't tell anything about the quality or strength of a leader or leader material by the name on the package, unless you know the language of the trade. A beginner might think he has picked up a top-notch leader when he reads "Refina superior" on the label. You find this designation on the labels of every manufacturer of natural gut leaders or leader material, regardless of brand name. It signifies a grade and size range. Refina superior, however, is anything but the top grade.

The names designating the various grades of gut leaders are so confusing that it is all but hopeless for the novice to buy what he wants when he shops for silkworm gut. So let's translate this leader gobbledygook into English. Manufacturers the world over label top quality gut leaders and leader material as Natural Selecta. This top quality also has seconds that reach the market under the name of Selecta. These are not second quality leaders, but seconds of first quality. Second quality leaders and material are labeled Natural superior. This second quality also has seconds, these are named Superior. Third quality leaders and material, which no angler [*Continued on page* 161]

IT'S NEW

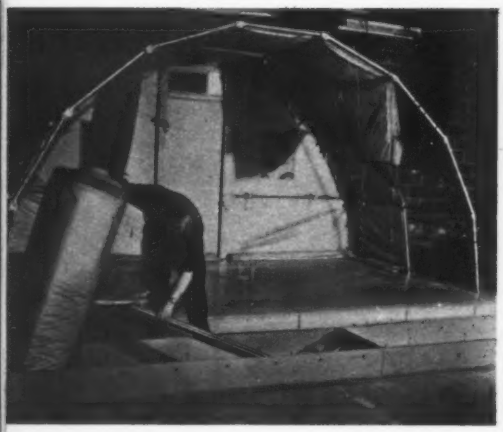
BUDDYSTICK designed for policemen is hollow, converts into stock for a .38 police revolver. Novel nightstick also has built-in flashlight and 100 feet of lifesaving nylon line.

CARDBOARD fuel, water containers are collapsible, have plastic liner to hold liquid. Marine Corps is testing the new tanks.

CONVERTIBLE MULE built entirely of aluminum, except for frame, totes 3,000-lb. load of men or cargo over tough terrain.

CONTINUED...

NATIONALIST CHINA-made car is their first. The 42-hp rig is said to get 30 mpg. It was made with technical assistance of Japanese. First production models will serve as cabs.



QUILTED shelter made for air transport has aluminum tubing, is assembled without tools. It has plastic windows, fits into plywood boxes which also serve as floor.

SAFETY device lets anyone transmit wireless message, sends appropriate dot-dash signal for each key pressed. It is being installed in many Scandinavian lifeboats.

BLOW-UP hat is latest Parisian fashion. Hat can be stored in handbag but inflated, protects wearer from sun or rain. It can be worn anywhere, according to designer.

MUSCLE-POWERED aircraft is Flycycle, designed by two Belfast Irishmen. It is 20 feet long, weighs 500 pounds, is driven by pedaled eight and one-half-foot rear prop.

FOAM HOME is formed by spraying self-rising foam over inflated canvas shell. Bayonet is used to cut doorway. U. S. Army says it may lead to chemically-built GI tents.

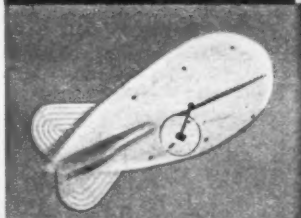
LONDON'S BALLOON CAMERAMAN

BALLOON is filled with hydrogen by the photographer with aid of his assistants.

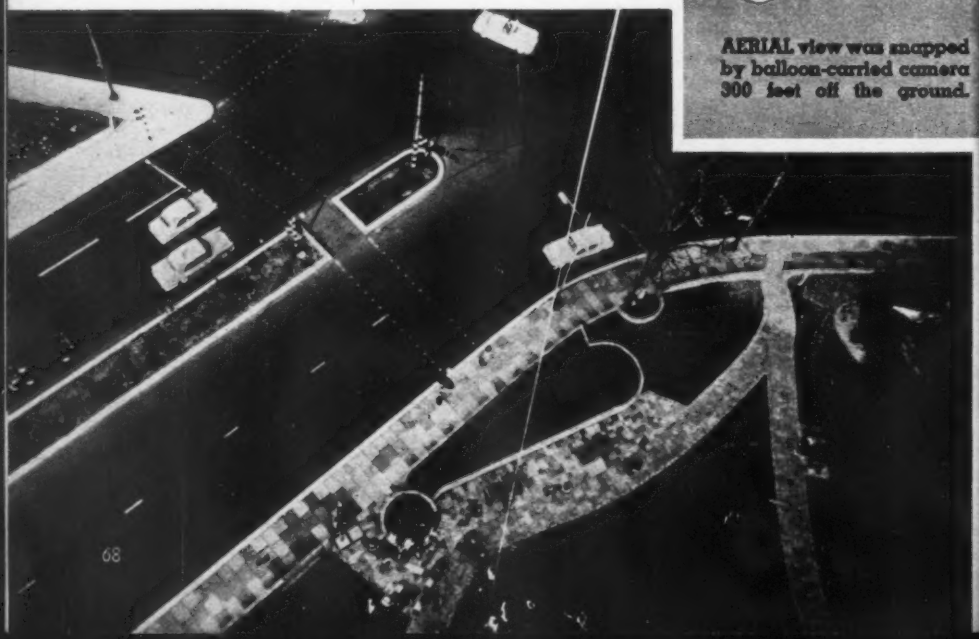
CAMERA is fitted in bicycle wheel frame which is slung under balloon.

WINCHMAN triggers the camera lens via button. Cord secures rig.

LONDON photographer Conrad Nockolds takes aerial photos from the ground. He uses a hydrogen-filled balloon to tote his camera on a specially adapted frame. The whole rig is tethered to a ground winch via nylon cord. It enables him to trigger the camera's lens and take pictures 300 feet above London. •



AERIAL view was snapped by balloon-carried camera 300 feet off the ground.



ONE-HAND SHOTGUN

ONE-HAND shotgun is carried by shoulder strap and is easy to fire from car with only one hand.

OFFICER Al Crouch of the Santa Monica, Calif. police force has devised a modified 12-gauge shotgun designed for fast action and one-hand operation. Crouch made sketches of his new weapon two years ago after two police officers were killed in ambush.

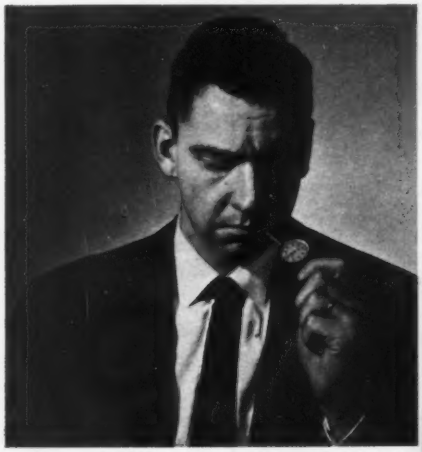
The new gun has been patented and is being considered by Remington Arms. The piece fires three rounds semi-automatically through a 16-inch barrel. Overall length is 26 inches. Conversion of the standard Remington automatic was done by chopping down the barrel, removing the stock and attaching directly behind the receiver a free-turning, oval-shaped yoke which rests in the crook of the arm. The pistol grip is made from a solid block of aluminum. Effective range is 50 yards. •

SANTA MONICA POLICE

BRIGHT IDEA AWARD
MECHANIX ILLUSTRATED

DIAL-FACE THERMOMETER

THIRTEEN bucks buys you a new type of medical thermometer that seems worth the price. First of all, you know little Willie will not chew it up like ribbon candy. It's stainless steel. That means not only that Willie will not be adding ground glass to his diet but that you will not be facing the fact, at one a.m., that you have neglected to replace a broken thermometer. People who can't read regular thermometers will like the big dial and those who can't shake down a thermometer will like the re-set button atop the dial case. This instrument is shockproof, so the rough-and-tumble of family life won't mar its high accuracy. That's because the stuff inside is not mercury but a blend of other heat-sensitive metals. The thermometer can be used orally or rectally and can be sterilized in the usual way. Made in Switzerland, imported by Cary Thermometer Co., 100 West 42nd St., New York 36, N. Y. •



EASY-TO-READ and unbreakable Swiss medical thermometer is encased in stainless steel. It's much safer for home use.

WIN $50

MI will award $50 each month to the first person who tells us of a new and useful gadget that is patented and in production. Manufacturers are also eligible for this award. Pictures and a description should be sent to Bright Ideas Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y.

CROSSING DELAWARE with more gear than Washington had. Go easy over tracks, bumps.

HOW TO USE A RENTAL TRAILER

By Jim McMichael

CHECK TIRE PRESSURE regularly. Four-plies should have 35 lbs., six-plies 45 lbs.

THE next time you move, why not move-it-yourself with a rental trailer? You'll save real money. Just to show you, you can move a houseful from coast-to-coast with a rental trailer for about one-third the cost of a pro moving.

Most brand-name trailer rental companies ("U-Haul," "Nationwide," etc.) rent through service station outlets. The Yellow Pages under "Trailers-Rental" will tell you where to go. Then you have to pick the type best suited to your load—and don't pick one any bigger than you need. Trailers can be divided into three classes: the popular two-wheel open trailer, the van or hardtop, and the four-wheel tandem.

Open trailers are easier to load and

CHECK YOUR HITCH, safety chain, brake lights regularly; keep lug nuts tight on wheels.

WIRING trailer's brake lights into car's. Quick, easy, requires no splicing or tape.

BALL AND SOCKET joint hitch. The safety chain hooks to car frame—just in case.

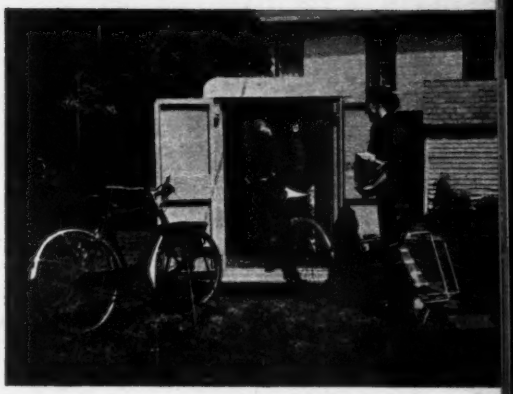
they offer less wind resistance. When covered with a tarpaulin they give your cargo reasonable protection from road tar, dust and rain. But unless the tarp is in good shape and tied down as well as Popeye would do it, its flapping could drive you batty in a few miles and could also cause damage to anything fragile you might be toting. Van trailers provide greater protection and they can be locked securely—important for overnight stops. Four-wheel tandem (or dual axle) trailers make really big hauls possible. They are generally rentable in either soft or hardtop models and should be selected for loads in excess of 1500 lbs.—the maximum load limit for a two-wheeler. The four-wheeler can lug 3000 lbs. legally. That means, in most state laws, the *combined* weight of trailer and load unless the trailer has an independent braking system.

On a local basis you rent a trailer for a specified period of time and you must drive it back to the place where you rented it. For instance, the writer rented a Nationwide 4x8 open trailer from agent Jim Drake in Phillipsburg, N. J., drove to Wilkes-Barre, Pa. (about 110 miles one-way), loaded up with furniture, drove back to Philadelphia, unloaded the trailer and returned it to Phillipsburg the next morning—all for $5.00!

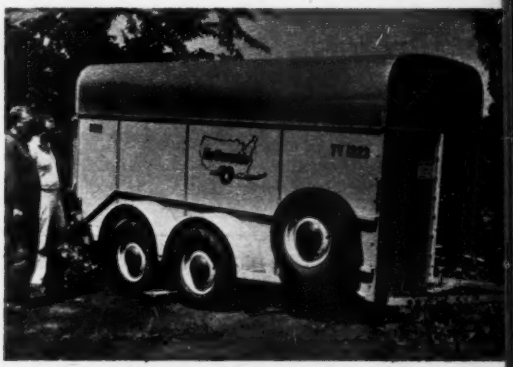
After the first few miles I felt like an old pro and except for backing the rig down a driveway, my palms were dry all the way. The $5.00 rental fee included the use of the trailer for a 24-hour period plus the labor of hitching it on to my car and unhitching it the

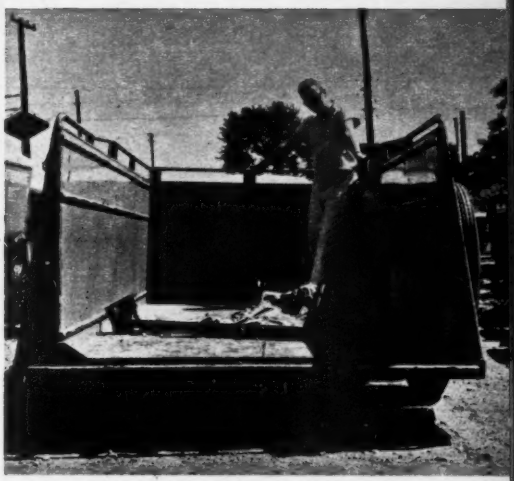
next day and complete cargo insurance. Cargo insurance includes coverage "not to exceed $1,500 from Fire, Lightning, Flood, Explosion, Cyclone, Windstorm, Collision, Upset or overturn of the towing conveyance." Your cargo is not covered against damage from rain, sleet, snow or hail. If your trailer should break down while on the road, you call the nearest rental agent and he'll come out to where you are and either fix the trailer or replace it. For any repairs that must be made to the trailer you will be reimbursed by the renting company upon presentation of a receipt.

Long-distance hauling has been simplified by the major trailer rental outfits. You rent a trailer at a local station and return it [*Continued on page* 164]



BIKES and items likely to shift should be tied down. Load all heavy items forward.





TRAILER TYPES to suit every need. Above is the very popular two-wheel, open, stake-body type. Above, right, a two-axle van or hardtop. Right, a large box-body soft-top. Hitches for almost every make and model of car are rented with your rental trailers. Advice on how to load the trailer is free.

$647 Utility trailer with a college degree carries two-man fishing boat, has two removable bunks and icebox. As a cargo hauler, it can pack 300-lb. load

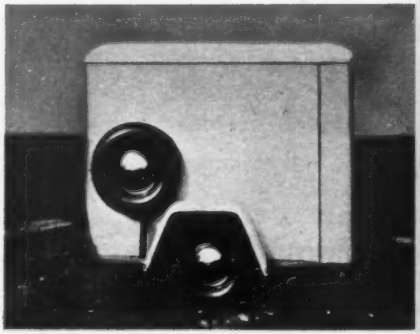
Knight Mfg., Inc., 836 Ashby St., NW, Atlanta 18, Ga.

Trailers YOU CAN BUY OR BUILD

By Robert G. Beason

MOST any current economic fact sheet will tell you we all own more things than ever before. For not a few of us this poses a big problem: what to haul them around in? Unless you happen to own a truck line or prefer the cozy feeling of sitting in a silo after stashing things in the car, your best answer is a small luggage or utility trailer.

Private ownership of small trailers, dealt a smash in the short ribs after World War II by rental outfits, is making a big comeback. Depending on size and loading capacity, a utility trailer can be obtained for a modest



$475 Small van shelters 1,500-lb. load in 4x8-ft. bed, is five ft. high. Box version of trailer sells for $267.50.

Orange Trailers, Inc., Route 23, Wayne, N. J.

$77 One-wheel, double-hitch trailer by Sears, Roebuck holds 500 lbs.

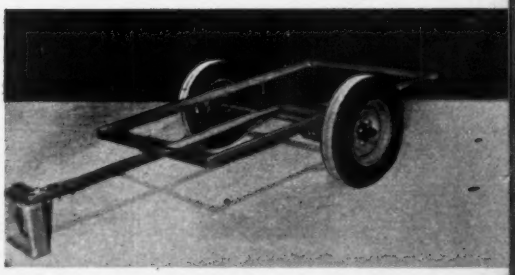
$177 Rugged platform trailer can carry 2,000 lbs., takes rack.

Foreman Mfg. Co., 5353 S. State St., Chicago 9

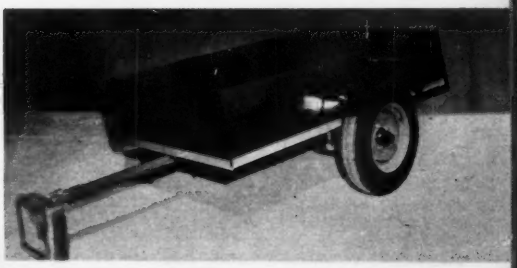
$224.50 New Sportable is for compact sports cars, comes in a luggage version (right); sleeper, $289.50, and 1,000-lb. utility model, $156.50.

Mastercraft Trailers, Inc., Middletown, Conn

$99.50 Steel bed of Montgomery Ward unit carries 750 lbs.



$94 Kit trailer comes with everything but bed and tires, is sold for . . .

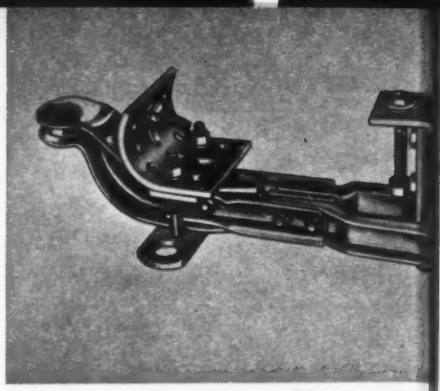


$153 Completely assembled by Ideal Mfg. Co., Oskaloosa, Iowa.

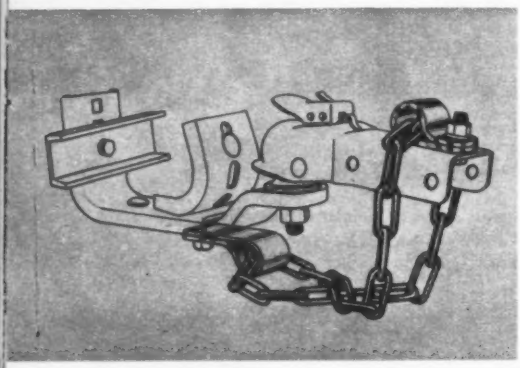
sum. Maintenance is extremely simple and storage can be a matter of standing the trailer on its tailgate in some sheltered place.

On these pages are shown some types of utility trailers which can be purchased nearly anywhere, along with two hybrid varieties that offer poshy refinements, and the basic accessories needed by a trailer owner.

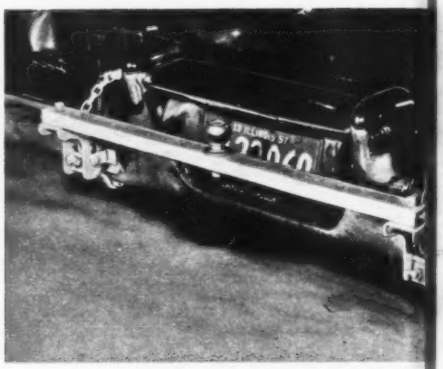
The average utility cargo-hauler has a bed measuring some four feet across by five feet long, with sides nine or ten inches tall. Ca- [*Continued on page* 166]



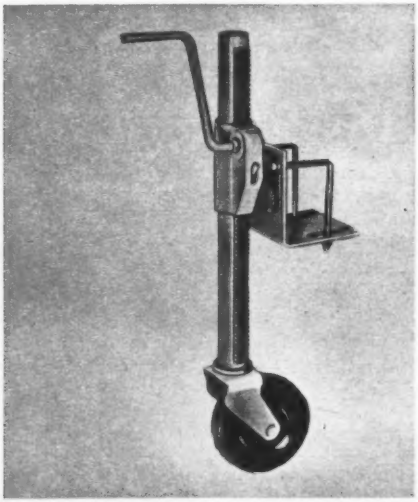
BASIC permanent trailer hitch attaches to bumper and frame of car and costs $6.98.



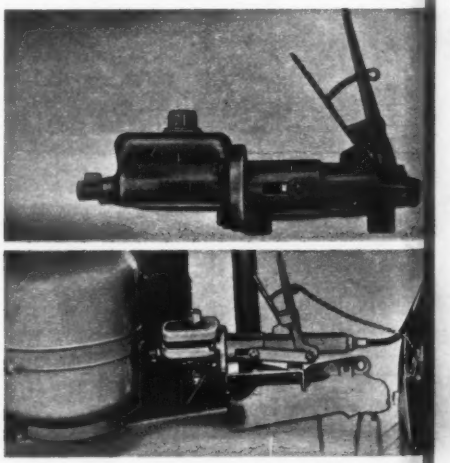
SAFETY chain saves trailer and following cars if hitch uncouples; price is $2.49.



STRAP-ON hitch for $12.95 attaches to the bumper; hitches by Ideal, sold by Sears.

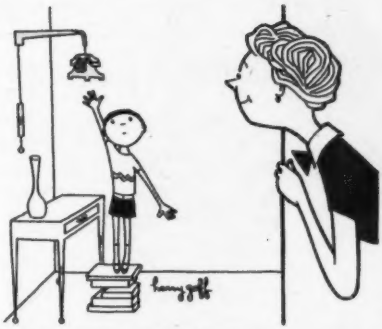


JACK WHEEL makes unhitching loaded trailer an easy job. Sold by Ward's for $12.46.

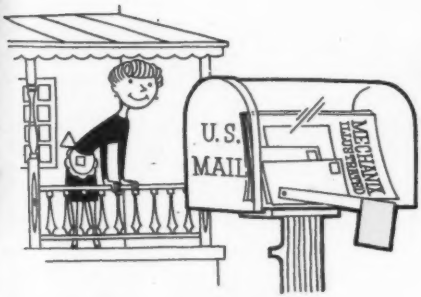


BRAKES for trailer are provided by this coupler, mounted on tongue. When car's brakes are applied, coupler brakes the trailer; made by Stromberg Co., Chicago.

CAR RADIO DIAL placed on the steering post to make tuning in more convenient and much safer. Michael Tirpak, Detroit, Mich.



PULL-DOWN TELEPHONE to save space and to keep young children from tying up the line. F. W. Salisbury, Berkeley, Calif.



TRANSPARENT MAILBOX, plastic, to eliminate unnecessary trips to see if MI has come. Judy R. Cruise, Copper Hill, Va.

INVENTIONS WANTED!

Is there a gadget you think should be invented? If so, send its description to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N.Y. 36, N.Y. Each one printed will be awarded $5.

RANGE-FINDER binoculars for yachtsmen, hunters, etc., to give distances to chosen objectives. Bob J. Bussoli, Cle Elum, Wash.

CARTOP ANTENNA built into roof to foil antenna-clipping punks, low garage roofs, etc. Joseph Sebastian, Jr., Farrell, Pa.

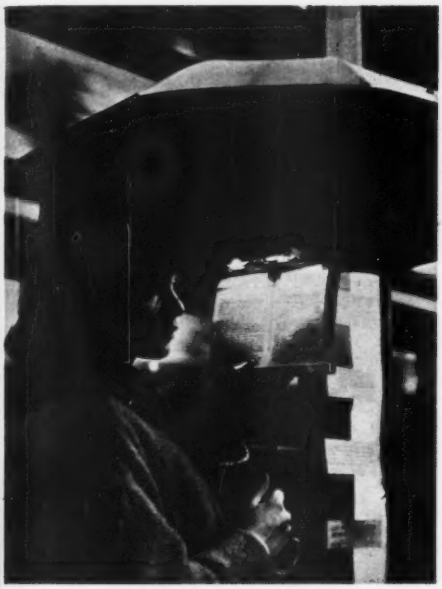
NICOTINIC SPECTACLES to free smoker's hands for work—and to keep smoke out of eyes.

WIZARD OF

INVENTING is a joy in itself; proof of this is a wealthy Englishman named Cyril Blenkinsop Gittins, seen at left with his no-hands cigarette holder. Inventing for him is the endless search for philanthropic devices. For instance, his washing machine for waterproof clothes, his mustache drier and his long-handled corn remover for fat boys. For modern woman he has created a no-neck-bend shampoo bowl, a 100-stroke automatic hair-brushing machine and a chain to which a girl can attach everything in her handbag. Instead of pawing among the mess inside she can just haul out chain until she comes to what she wants. Another hobby of Gittins' is keeping a wine cellar with every known grape or grain beverage in it. "But I think of my inventions only when stark sober," he says. •

COMPACT BUTTONS free her of her handbag slavery. In one she keeps her powder, in another a pad and pencil, in another a calendar; the fourth serves as an ashtray. An escort has to carry all the rest.

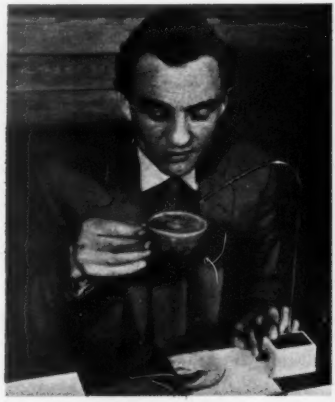
ODDS AND ENDS



QUEUE-UP UMBRELLA provides shelter from London weather, book-holder, light.

QUITE A HANDFUL is this little pal of the inventor in this obviously handy seat.

REEKING BOWLER combines practicality with chic, a "locomotive look" with traffic cop aplomb.



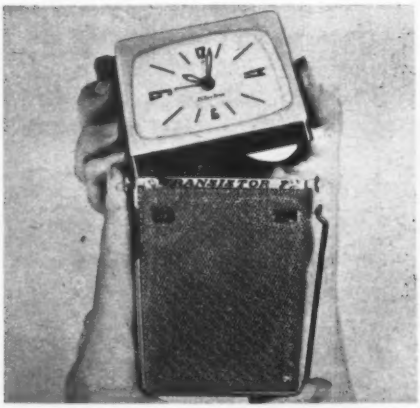
COFFEE COOLER ("for your cooler java enjoyment") brings down temperature in the cup without involving you in a social inelegance.

HEADLIGHT SPECS are great for reading after lights out in the dormitory. Lenses are optional.

Now See This!

FUN BOAT for children and adults is made of tough, lightweight Marlex plastic. The little boat floats even when it is filled with water. It weighs eight and one-half pounds, is five feet long and has a 28-inch beam. $29.95. New model is due shortly, according to Technical Plastics Co., Los Angeles, Calif.

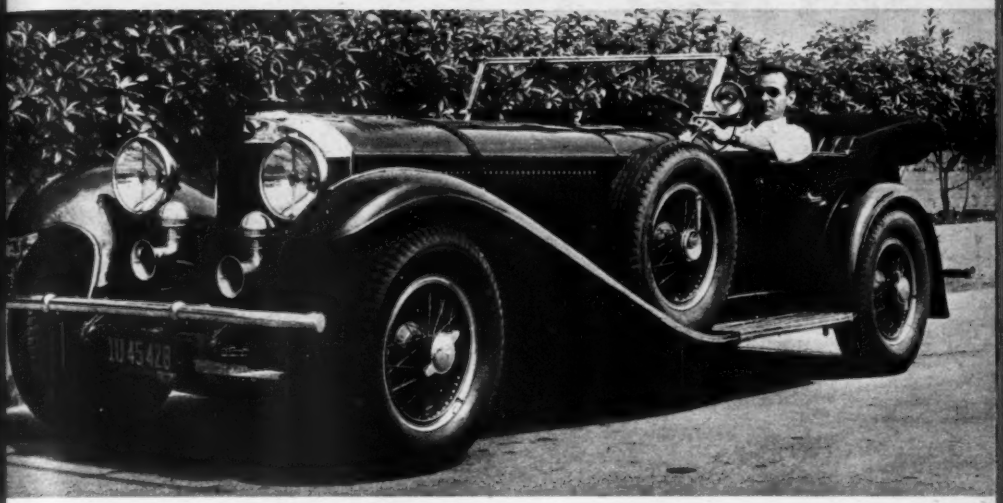
REFLECTAL can be used by both professional and amateur photographers. It consists of a reflecting fold-up umbrella which can be stored in a carrying case. Reflectal is designed for use with lamp assemblies of six to 12 inches in diameter. It gives the photographer the soft, diffused illumination of indirect lighting with complete control and direct light efficiency. Photo Lectronic Research, New York, N. Y. $36.50.



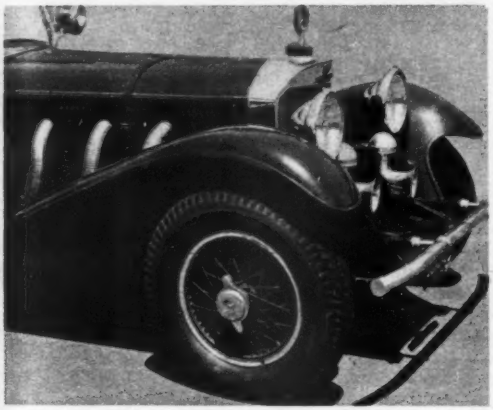
STARTONE miniature portable clock-radio is completely transistorized. Japanese-made unit is three by six and one-half inches, weighs a pound. It operates over 150 hours on nine-volt battery. Clock has 30-hour windup movement, can be removed from chassis. The device comes with carrying case, battery, earphone, desk stand. Pentron, Chicago, Ill. Startone price is $49.95.

TURBO-JET developed by Williams Research Corp. of Walled Lake, Mich., is world's smallest, according to its maker. The tiny power plant weighs 23 pounds, puts out 70 pounds of thrust. It is designed for mounting on the tips of helicopter rotor blades and for other light airplane uses, military and commercial. The powerful engine has an operating speed of 59,000 rpm.

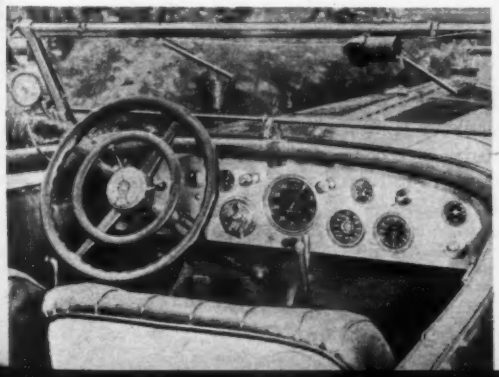
BRUTE OF THE ROAD



MERCEDES-BENZ SS. Classic looks, speed and power made it one of all-time great motor cars.



HUGE 431-cubic-inch mill gave car a top speed of 120 mph. Steering wheel, clutch and shifting—it has no synchromesh gears—required real muscle.

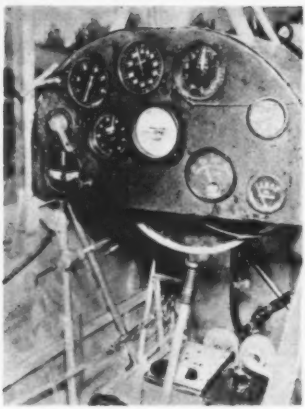


BIG, fast and beautiful is this renowned Mercedes-Benz SS which was one of the world's most coveted automobiles back in the late 1920s. The brutes of the road, as they were called, got their reputation because they were tough to handle. It took raw muscle to steer as well as shift the non-synchromesh gears; the clutch was a real leg-buster and it is said that no one ever had the strength to really jam on the brakes.

Despite these drawbacks, a 136-in. wheelbase and two-ton weight, the Mercedes-Benz SS was one of the best competition cars of its day. Its huge 431-cubic-in. engine put out 200 hp and topped out at 120 mph when the throttle was floored.

The car shown here sold for $13,000 and many with elaborate bodies cost more than $20,000. It still is an impressive car for a man to own. •

FLYING FAMILY

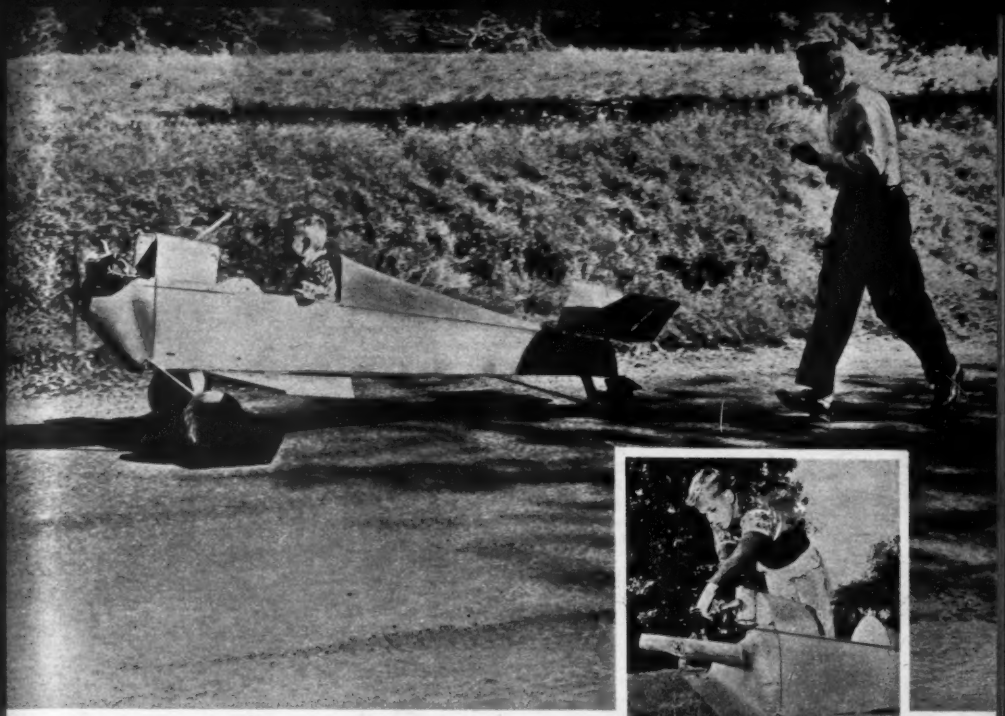


MIGHTY MITE is rugged, single-seat plane built by Carl Thompson in spare time. He also installed instruments at left and steerable tail wheel, right. The craft is an original design, cruises at 150 mph.

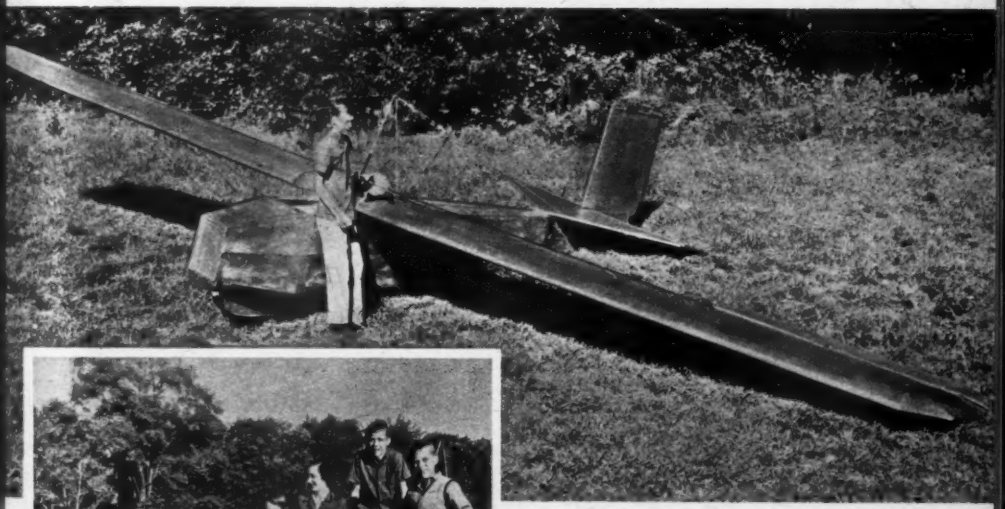
FLYING is business and pleasure to the Carl Thompson family of Suffern, N. Y. Thompson, an Eastern Air Lines Captain for 17 years, has imbued his clan with a love for aviation. Mrs. Thompson, for example, has her pilot's license. Seventeen-year-old Blaise has a student's license and already has built and flown his own glider. Ero, 11, built and operates a ground trainer and Florice, ten, is her father's chief assistant and has an amazing vocabulary of technical aviation terms.

A large barn on the farm serves as a workshop for the family. Thompson, an early barnstormer, has built nine airplanes. Mighty Mite, a single seat sports plane, is designed for steep climb and short field operations. It cruises at 150 and has a top speed of 165 mph. The craft is fully aerobatic and can take up to seven Gs. It is an original design and required two years of spare-time work to build.

All in all, the Thompsons are truly a flying family. •



GROUND TRAINER was designed and built by 11-year-old Ero, with Dad's help. It has a lawn mower engine and revs up to 2,200 rpm, sounds like a real plane, taxis at 15 mph.



FLYING FAMILY, left: Bart, the collie; Dad; Florice; Mom; Blaise, Ero. Above is a glider built and flown by Blaise.

MONEY MAKING IDEA

ANGLES BY SQUANGLE

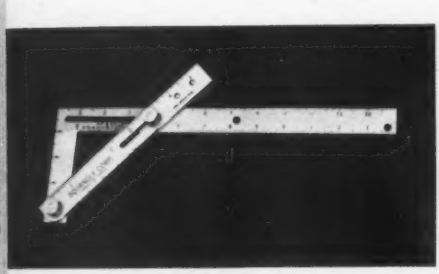
INVENTOR Hanson marks rafter via Squangle. Many uses of tool are illustrated below.

By Robert Edwards

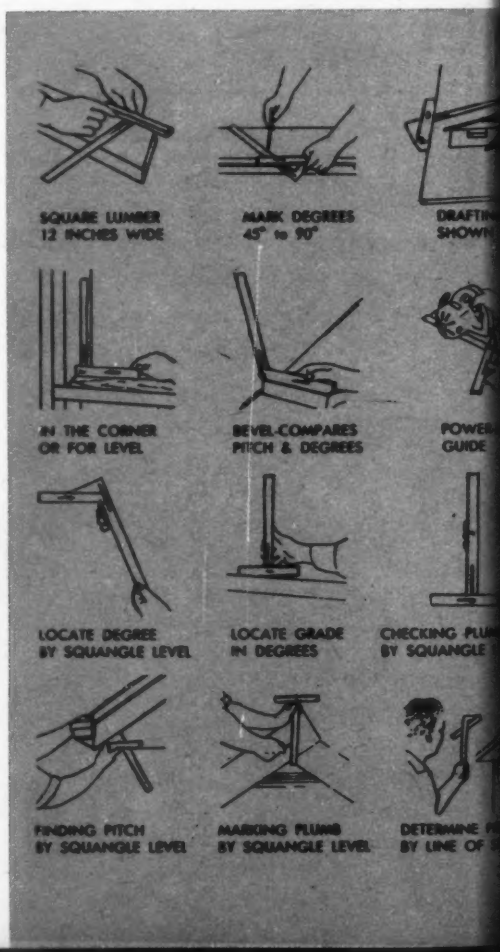
IF you can come up with a new angle, your chances for success are greatly enhanced. Ove Hanson of Lynnwood, Wash., combined an angle with a square and devised a new and versatile tool he calls a Squangle.

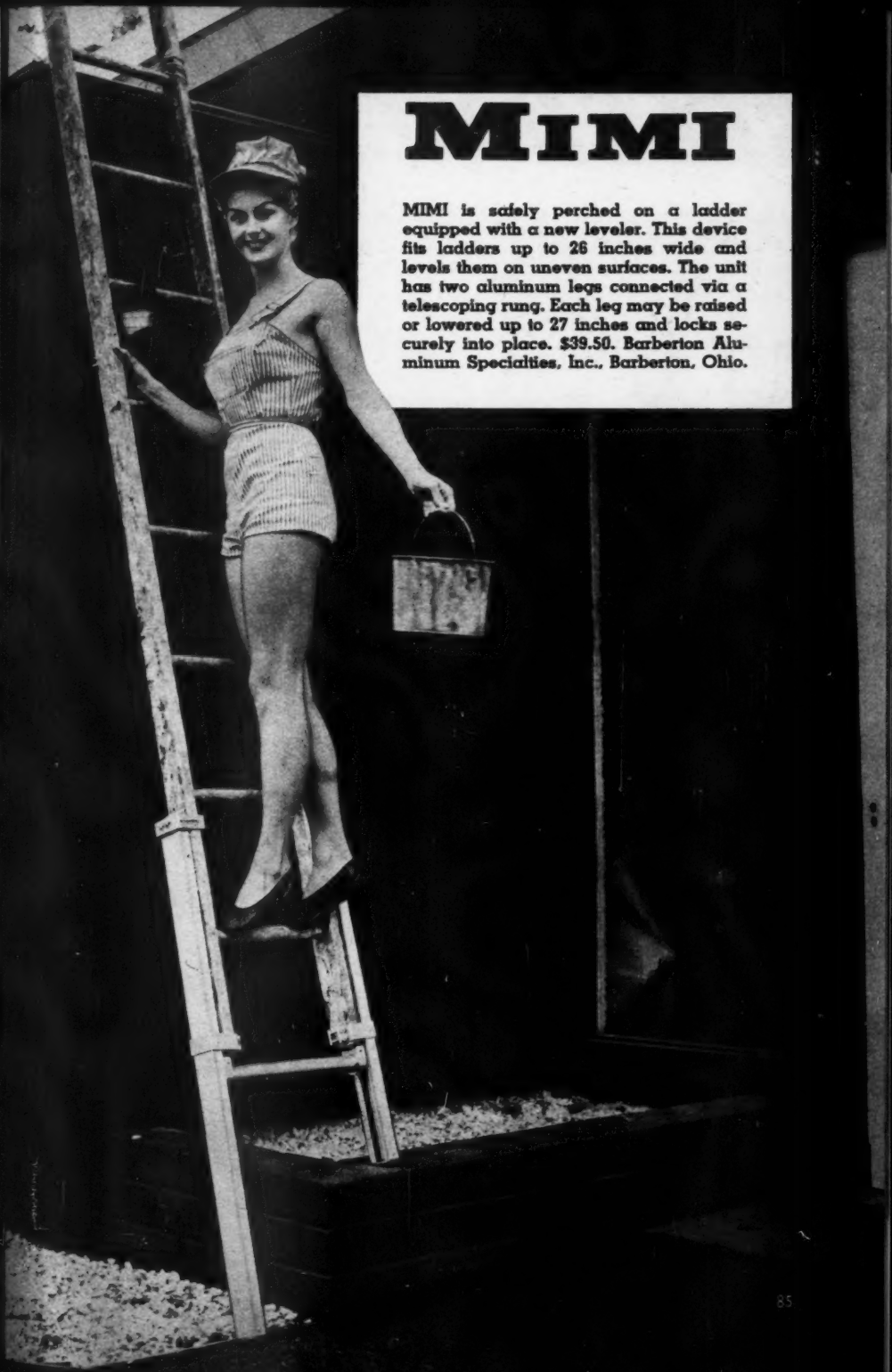
Two years after reaching the market, Squangle sales now approach 2,500 a month with a gross profit of almost $2,000 per month.

What is a Squangle? "It's a framing square in your pocket," says Ove. The Squangle is more than one tool—it can be used as a framing square, variable angle square, level, protractor, plumb, [*Continued on page* 167]



SQUANGLE two-sided crosspiece pivots about one end, slides at center slot when screw is loosened.





MIMI

MIMI is safely perched on a ladder equipped with a new leveler. This device fits ladders up to 26 inches wide and levels them on uneven surfaces. The unit has two aluminum legs connected via a telescoping rung. Each leg may be raised or lowered up to 27 inches and locks securely into place. $39.50. Barberton Aluminum Specialties, Inc., Barberton, Ohio.

SPEED WEEKS '60

CELEBRITIES at Speed Weeks included Dave Garroway (left), heavyweight champ Ingemar Johansson (center) and Paul Whiteman (right). Uncle Tom was Official Pace Car Driver.

New speed records and "the hairiest multiple crack-up of all time" marked a hectic two weeks at Daytona, including midget, drag and kart races.

By Tom McCahill

SPEED WEEKS 1960 were the busiest two weeks in Florida's history. They teed off with a nationwide TV show on Sunday, January 31, with more acts jammed into 90 minutes than Ringling was ever able to cram under a tent. The jamboree ended February 14 with the great 500-mile Grand National race which was on both coast-to-coast and Armed Forces radio networks. There were more celebrities in sleepy little Daytona-By-The-Sea than Toots Shor ever had in his old booze hut in a full year.

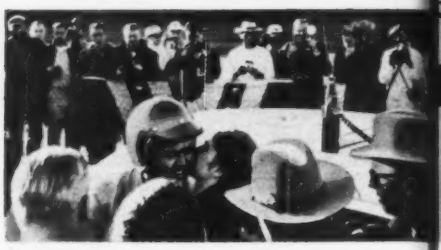
The first CBS-TV program showed the nation what was what in the compact car race. Chrysler's Valiant literally ate up the course. Ford's Falcon and Chevrolet's Corvair were completely outclassed, as was the Swedish team of Volvos that bravely attempted to stem the Valiant tidal wave, to no avail. Also crammed into that hour-and-a-half show was a sports car race won by a D-Jaguar, a Le-Mans start two-lap race for women (won by a Valiant) and a 25-lap Grand National race. All this was peppered with beer commercials and chit-chat by fun-loving Paul Whiteman, Walter Cronkite and some CBS scrubs. Two weeks later, for the bigger events, Dave Garroway and an NBC crew took over to televise Gar-

VIEW from Pace Car shows cars getting up speed for Daytona 500. A '59 Chevy took first place with average speed of 124.74 mph. No one was killed in 21 accidents!

SPEED WEEKS '60

VALIANTS lead in start of the compact car race. They swept the field.

NASCAR prexy Bill France directs events during the hectic Speed Weeks activities.



WINNER of 500-mile race, Junior Johnson, gets a kiss from actress Donna Anderson.

roway's "Today" show.

My job, aside from Speed Trials Director on the beach, was being the Official Pace Car Driver for all events. As such, I had to chauffeur a reigning celebrity around the oval to start a race, or sit by the celebrity while he drove. On the first day for CBS, I had Ingemar Johansson as my riding passenger. Though he's a real great guy, I got the feeling "Boy, if I was only a few years younger I'd love to take him on for a pot of dough!" On another day, for NBC, Dave Garroway drove me around while I handled the radio, with Bob Davies, president of Autolite, as a rear seat passenger. Of course Dave is an experi-

SPECTACULAR CRASH occurred on backstretch of 126th lap of Daytona 500. Car driven by

MI TROPHY for Standing Start Mile was won by Bob Pemberton in a Pontiac for the second straight year. In compact division of Standing Start Mile, a Valiant won at 80.6 mph.

enced sports car driver.

The Modified race had the hairiest multiple crack-up of all time—37 cars in a single smash-up at better than 140 mph with no one seriously hurt, though the cars were strewn all over the course. This proved beyond question that Bill France's strict safety regulations on helmets, safety harness and roll bars do pay off. More than two dozen cars upside down or on their sides at fantastic speeds, and not a serious injury, seems like a miracle. Without France's relentless insistence on safety precautions at least a dozen men most likely would have been killed.

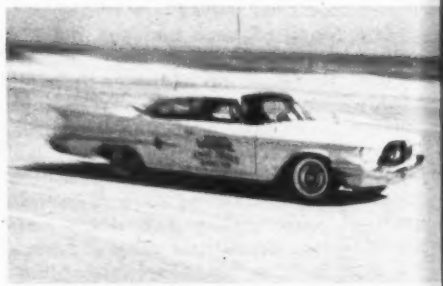
I drove the pace car for this race and as passengers I had the pilots of the U. S. Air Force's Thunderbird team. As we leaped around the high banked track, getting the cars up to speed, the captain of this group told me he was getting the thrill of his life, and so did the others. Less than two hours before I had watched these boys criss-cross the sky above the track at better than 600 mph and fly through their precision patterns. I couldn't help saying, "Damned if I know how this could thrill you, after the stuff you do." One of them answered, "Hell, that's easy—this is real scary!"

Russ DeYoung, president of Goodyear Tire & [*Continued on page* 153]

Tommy Herbert ripped guard rail and disintegrated. Herbert was injured, not critically.

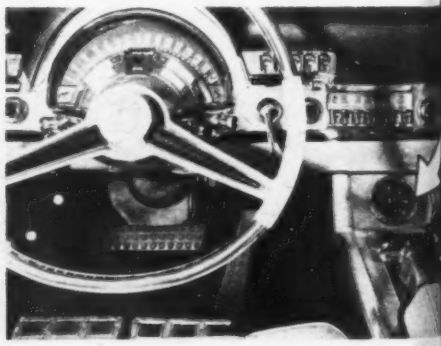
THE CHRYSLER 300 F

MUSCULAR 300F has mammoth grille. Its medallion is centered, held by chrome bars.



McCAHILL twice hit 135 mph over Measured Mile with extra gear aboard and no tune-up.

FLARING FINS house taillights. Wheel cover on trunk lid is only a decorative touch.



ARROW points to tachometer. There are no idiot lights and instruments are "great."

McCAHILL with car that shattered every MI sedan record at Daytona Beach this year.

"The undisputed world's champion of sedans," says Uncle Tom of this 150-mph swashbuckler.

By Tom McCahill

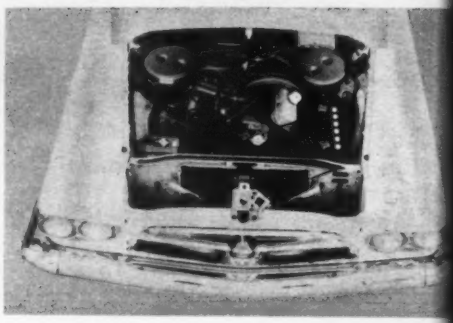
EVERY once in a while a real hairy car comes along with enough on the ball to stir up an adrenalin flood in the most jaded and ancient swashbuckler. Such a car was the first Chrysler 300 when it made its initial appearance on Daytona Beach in 1955. On its very first practice run it was timed at 131-plus mph. This was the fastest speed any sedan in the world had ever made.

The 300 set a Daytona record in 1956 of over 139 mph—a mark which stood until 1960. After 1956 other cars started hacking away at the 300's reputation as the World's No. 1 Bomb—but at lesser speeds. The 300, always a masculine bucket from its hubcaps to its distinctive grille, gave ground from 1957-59 to the unbeatable Pontiacs of that period. But all that is now past history; the 300s are back on top.

The 1960 300F is once again the undisputed World's Champion of sedans. It proved this by taking the first six places overall in the Daytona Beach Flying Mile. The winner averaged better than 144 mph in a strong wind. The third-place 300 hit 149.2 mph on its first leg. The leading cars were equipped with a manual four-speed box as smooth as oiled spaghetti. The 300 is an honest four-passenger sedan sporting deep bucket seats. It is just about the closest thing to a correct definition of a sports car with a roof that anyone could name. As a Gran Turismo competitor, nothing can come even close to this new hell-for-leather Michigan product.

The 300F actually comes in two versions: the four-speed box bucket and the slightly less hairy Torque Flite rig that can be had with such niceties as air conditioning, electric windows and the rest of the bric-a-brac you'd expect in a deluxe comfort barge. It can be bought either as a two-door hardtop or as a convertible. The suspension can be ordered with full 300 heavy-duty (meaning competition) suspension or standard Chrysler New Yorker suspension, which is

BUCKET SEATS fore and aft are finished in genuine beige leather, foam-rubber padded.



POWERFUL engine with Torque Flite automatic transmission puts out 375 brake hp.

still superior to that of any other car built in America (except for other Chrysler products).

My initial test was made with my Official Speed Trials Pace Car which had all the goodies aboard, including automatic transmission. Despite this, it broke every MI sedan record in the books, at every plateau, and now becomes the new MI Champion in the 15th year of these tests. Zero-30 mph averaged 2.6 seconds; 0-50 mph, 5.6; 0-60 mph, 7.1; 0-70 mph, 9.4; 0-80 mph, 11.3; 0-90 mph, 14.7; 0-100 mph, 16.9; 40-60 mph, 3.3 (!); and 50-100 mph, 12.8 seconds. All these tests were made with the automatic transmission in Drive range. These are all new records for production cars capable of carrying four or more passengers. Twice I timed the test car through the Measured Mile at better than 135 mph, with extra two-way radio equipment aboard and not even a casual tune-up.

The seats in the 300F are truly magnificent. The legroom in the rear is a little scanty for a coast-to-coast trip but ample for a drive to the country club with an extra couple. If rear seat comfort is desired, and the rear seat passengers are larger than marshmallows, not more than 150-200 miles is recommended. The rear seats are actually luxurious and spacious enough for one position but are not adequate for long leg crossing or much position shifting. Both rear seats are bucket seats, like the ones in front, with an unmovable divider between them.

The instruments are great—not a single idiot light in the whole assembly. The car also sports a tachometer mounted close to the floor. It is a little awkward to read at speeds better than 125 mph, when a long glance floorward could easily prove to be your last long glance anywhere. There are also two engines available for the 300F—one developing 375 hp and the other (standard with the stick shift) 400 hp. The lesser horsepower job is a better choice for a general all-around-use sports car. It is smoother [*Continued on page* 156]

TEST CAR SPECS

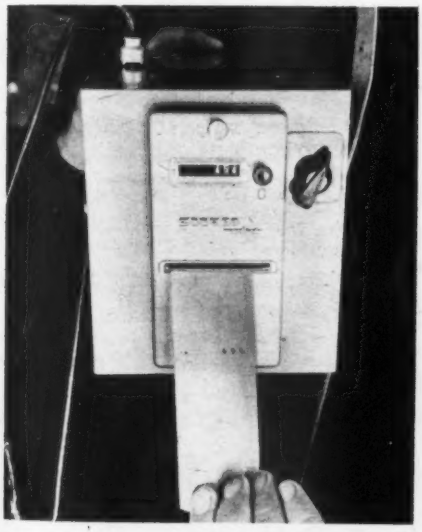
MODEL TESTED: **1960 Chrysler 300F**
ENGINE: **V8** cyls; **413** cubic ins; **375** brake hp; **495** ft-lbs max torque; **10.1** to 1 compression ratio. Bore **4.18** ins; stroke **3.75** ins. Fuel required: Premium. Standard axle ratio: **3.31.** Wheelbase **126** ins; length **219.6** ins; height **55.1** ins; width **79.4** ins; front tread **61.2** ins; rear tread **60** ins. Weight **4,270** lbs. Gas tank capacity **23** gals. Turning circle diameter **46.6** ft. Tire size **9.00X14.**
PRICE (without optionals): **$5,411.**
PERFORMANCE: **0-30** mph, **2.6** secs; **0-50** mph, **5.6** secs; **0-60** mph, **7.1** secs; **40-60** mph, **3.3** secs. Top speed **135** mph with automatic transmission; 150 mph with four-speed gearbox. All times recorded on corrected speedometer.

METER-READING machine plugs into socket outside of house. Occupants don't have to be home.

OUTDOOR METER-READER

A METER-READING machine which is plugged in from the outside of a house or apartment is now being used in London. The machine records the amount of electricity used since the last reading.

To read the meter, a plug leading from the nine-pound box is inserted in a socket outside the door of the house. A switch is turned on and the number of units which have been consumed is registered. This is recorded on a card or roll and a bill is rendered. A small counting device which is also connected to the outside plug socket is all that has to be added to convert existing meters. •



NUMBER of units which have been consumed is registered, recorded on paper roll.

BILL is rendered on the spot by the meter reader. Conversion to new system is simple.

THREE ARQUETTES—Cliff Arquette watches his big creation creating a shelf-size Charlie.

CHARLIE WEAVER'S MUSEUM

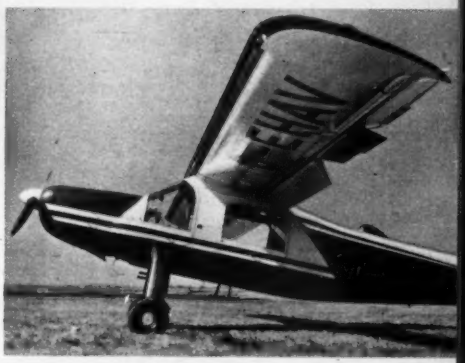
INSIDE Charlie Weaver, the Wild Old Man of the Jack Paar show, is Cliff Arquette—an urbane veteran of vaudeville, radio and TV who has opened his own Cliff Arquette Museum at Gettysburg, Pa. Chief display in the museum is his set of authentic Yank and Rebel soldiers. Each figure takes him about six weeks to complete. •

THREE SOLDIERS authentically carved and painted by Arquette.

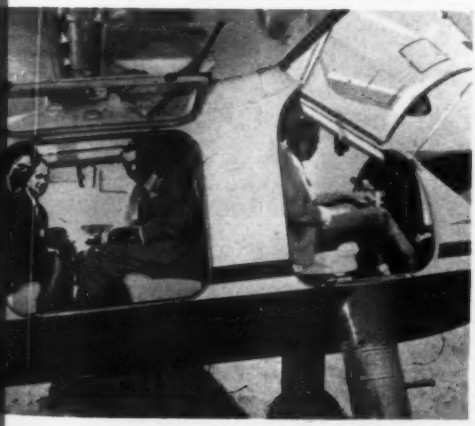
SCHOLAR AND CRAFTSMAN at work on a figure. Civil War has been a hobby for 25 years.

GERMAN SHORT-TAKEOFF PLANE

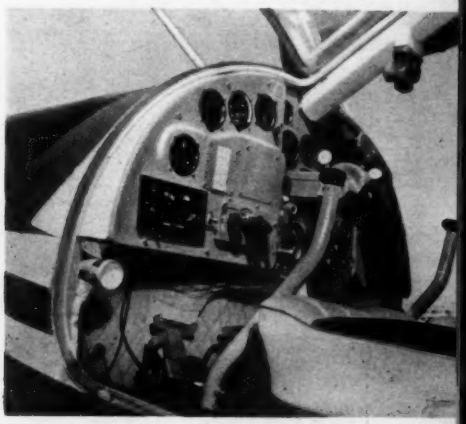
THE little plane shown hopping into the air above is the DO-27, designed and built by Claude Dornier—*the* Claude Dornier, who has begun building in Germany again, with Allied permission. His STOL (short-takeoff-and-landing) plane has a leading-edge wing slot and flaps that let it "sit on its tail" at takeoff and land at near-hovering speeds on a 100-ft. strip. •



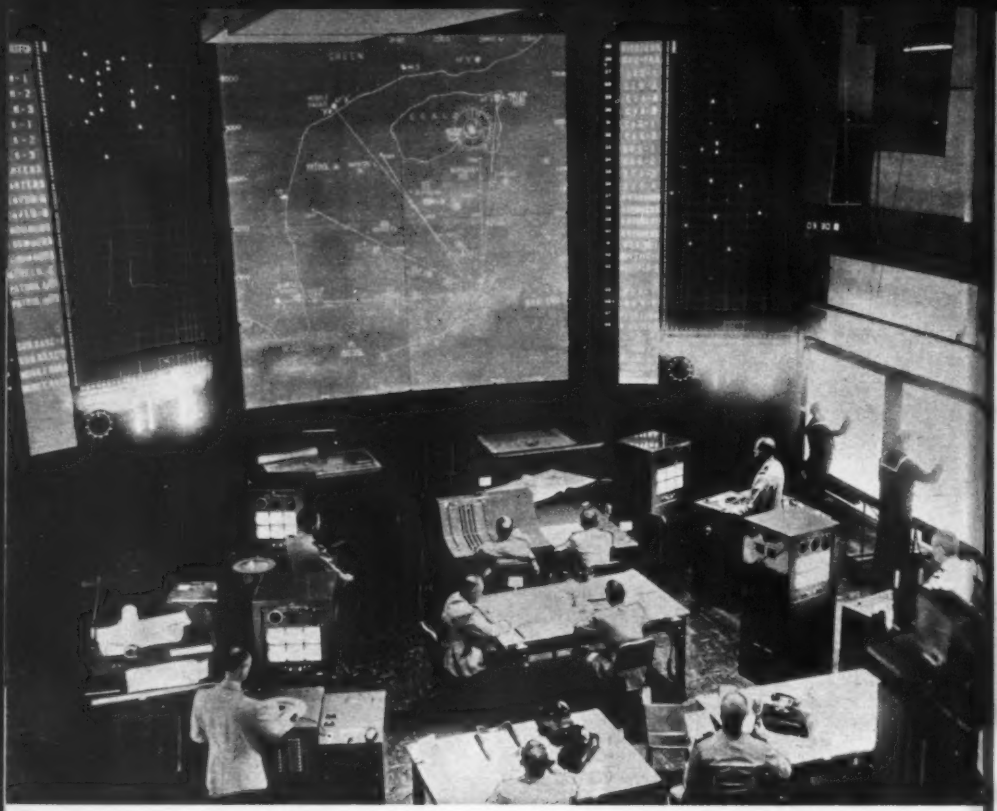
SLOTS AND FLAPS combination gives the DO-27 its STOL characteristics.



FIVE-PASSENGER plane (one rider sits up front) has fine visibility for a small plane.

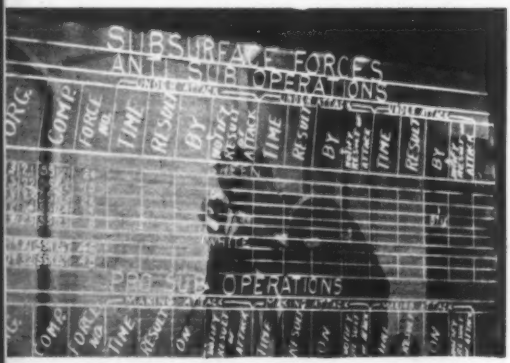


COCKPIT. instrument panel. DO-27 does 155 mph, has a 500-mile range.



MASTER ROOM where force commander and staff feed problems to NEWS, observe results.

ELECTRONIC WAR GAMES



MIRROR-WRITING on glass chart, sailor posts info without blocking view of board.

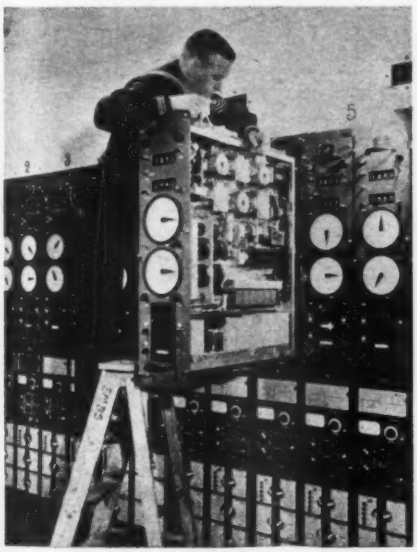
STUDENTS at the U. S. Naval War College at Newport, R. I., can now play an electronic war game that tests the judgment and experience of officers under startlingly realistic conditions. What makes the new style of war game possible is a three-story, block-long, $7,250,000 installation called NEWS—Navy Electronic Warfare Simulator.

Students—officers with 10-20 years of service—are offered combat problems involving the latest naval methods. Basically an electro-mechanical means by which two groups of officers may oppose each other in a simulated naval warfare, NEWS was developed for the most part by Naval Electronics Laboratory in San Diego.

DIALS determine quantity, type and firepower of vessels used in battle problems.

OFFICER uses phone to check control room information. Atmosphere is deadly serious.

War games have been played (by the Germans chiefly) for 300 years. Originally played as a variety of chess, involving semi-realistic battle factors, German war games became less and less rule-dominated, more and more for the development of originality and daring in army commanders. Until WW II, war games were played on boards and charts; these methods are no longer adequate, and the use of electronic playing equipment has become imperative. •



TECHNICIAN adjusts complicated mechanism of warfare simulator. Naval Electronics Laboratory, San Diego, designed NEWS.

COMMAND CENTER—one of 20—where officers and men feed information into the electronic brain, plot results, during game.

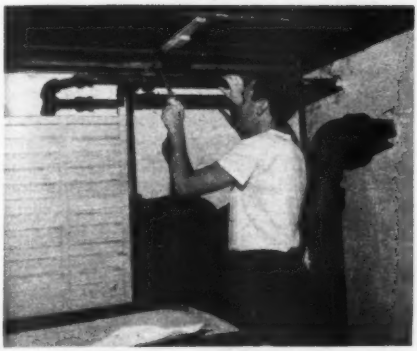
So you're gonna buy

Well, it may be the biggest investment of your life, so investigate and consider every angle.

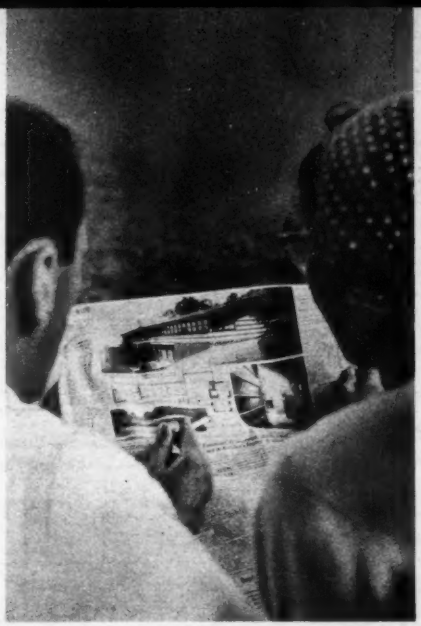
OF all the things an average family ever buys, not one is nearly as important and expensive as a house. Every aspect of the purchase deserves careful consideration and those who buy hastily—don't shop around, compare prices and use good judgment—may be in for trouble.

In buying, the typical family should first decide how much they can invest. A rule of thumb is to spend roughly two and a half times the annual income. Thus, $6,000 a year puts a family in the $15,000

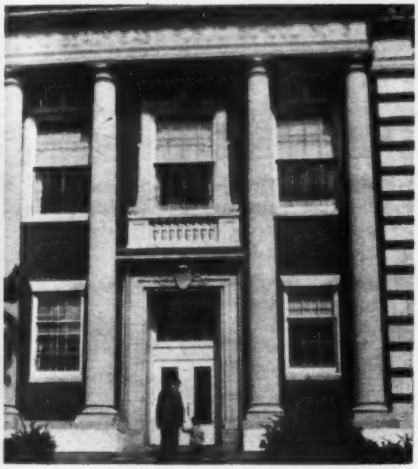
a house



NEED for constant repair in your present home may be a reason to seek another one.



TAKE TIME to shop carefully for a good buy. Check newspaper real estate sections.



SCHOOLS and their accessibility are important to parents in considering a house.

GET THE HELP of a good realtor in your search for a house that meets your needs.

house bracket. But the house hunters should not forget the additional costs that accompany a purchase: insurance, closing fees, lawyer's fees, moving and new household equipment. This in addition to the regular monthly expenses which include mortgage payments, local taxes, utility costs and transportation to and from work. These monthly expenses, realtors estimate, shouldn't ex-

SHOPPING CENTERS near the house under consideration are important to the buyer.

BACK YARD is another thing to consider. If it can be closed in, young ones are safe.

KITCHEN EQUIPMENT should be thoroughly examined. Is it adequate for your family?

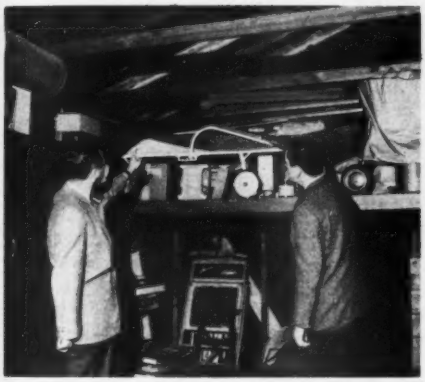
HEATING UNIT bears inspection. Is it a type which suits the house construction?

CLOSET SPACE should be checked to make certain that it meets the family's needs.

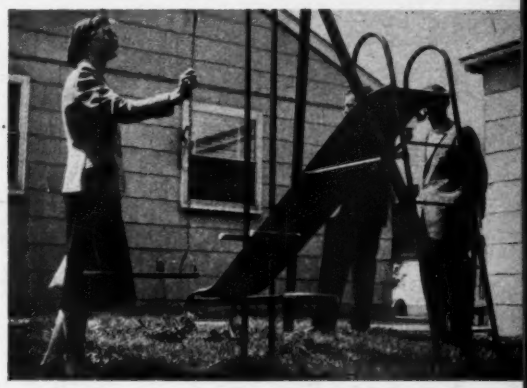
WINDOWS must allow ample light and ventilation. See that they operate smoothly.

ATTIC may be important only for storage or for future development as living area.

PROPER INSULATION keeps house cooler in summer and reduces winter heating bill.



GARAGE has another asset if it is large enough to allow some extra storage space.



PLAY EQUIPMENT may not be included in sale. Buyer should know what he's getting.

CHECK OUTSIDE window and door joints; loose fits allow wind and rain to enter.

DRAINAGE facilities on outside of house should be adequate and in good condition.

ceed a week's take-home pay.

After the available money is considered, a house to meet the family's needs can be sought. But it's a fact that many buyers simply don't know what to look for—and the things to look for are numerous. So, with pictures and through use of the chart, we've outlined a plan of action. Naturally, each point raised requires more than cursory attention. Take the time to find out what makes good insulation, a good heating system, good plumbing, etc. It's worth it—you'll be spending a lot of money. •

WHAT TO LOOK FOR WHEN BUYING A HOUSE

HOUSE AND LOT

Size, shape and topography of lot relative to house
Price of lot relative to price of house
House and lot relative to other units in vicinity
Possibilities for attractive landscaping
Garage facilities

THE LOT

Size
Shape
Drainage
Soil characteristics
Existing landscaping
Garden possibilities
Grading and filling required
Character of adjoining properties
Privacy

CONVENIENCE AND ACCESSIBILITY

Journey to work
- Time
- Cost
- Facilities

Stores
Schools
Playgrounds
Churches
Amusements
Parks
Streets
- Layout
- Paving
- Drainage
- Sidewalks

THE NEIGHBORHOOD

Property maintenance
Approach of industrial and commercial development
Absence of:
- Smoke
- Excessive traffic or other noise
- Unpleasant odors
- Other nuisances

Character of neighboring development
- Residential
- Other

Stage of progress of development
Favorable winds, pleasant vistas

PUBLIC UTILITIES AND SERVICIES

Water supply
Sewerage facilities
- Sanitary
- Storm

Gas
Electricity
Street lighting
Fire and police protection
Garbage removal
Trash removal

THE PURCHASE TRANSACTION

Results of appraisal
Tax status
Terms of land contract
Developer's ability to give clear title
Developer's record and reputation

PROTECTIONS AND LIMITATIONS

Private restrictions
- Use of lot area
- Type and use of structures
- Duration

Zoning regulations

THE COST CALCULATION

For a Building Lot:

Total price
Down payment
Balance of purchase price, including interest
Possible special assessments
Assessed value
Tax rate

For a House and Lot: (Monthly Cost Estimate)

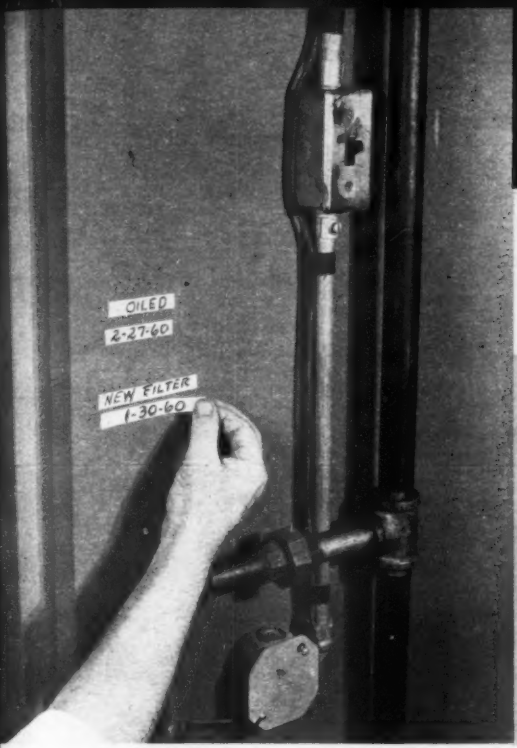
Mortgage payment, total or principal
- Interest
- Taxes
- Insurance
- FHA insurance premium
- Appraisal fee
- Title search
- Other

Utility services (operating expense)
- Water
- Gas
- Electricity
- Heat

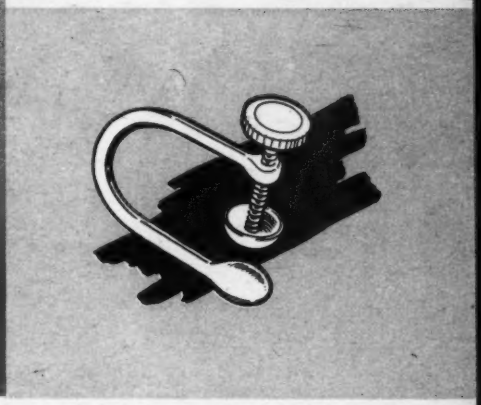
Maintenance
Special assessments
Special services (trash removal, etc.)
Transportation to work

Chart courtesy Housing and Finance Agency, Wash., D. C.

HOME HINTS

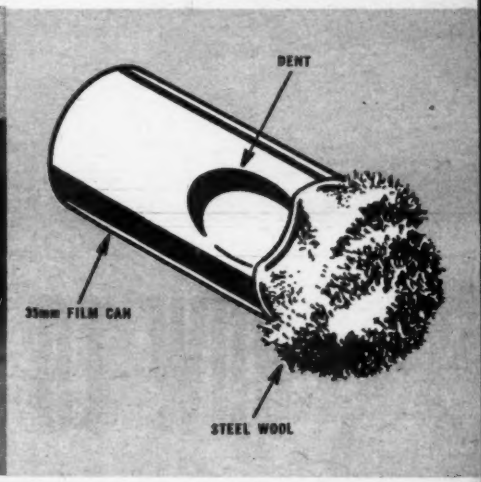


YOUR OIL FURNACE must be serviced at regular intervals for efficient operation. Mark dates on adhesive strips, attach to wall or cabinet.



SCREW-TYPE earrings which are about to be discarded make good glue clamps for those small parts in modelmaking.

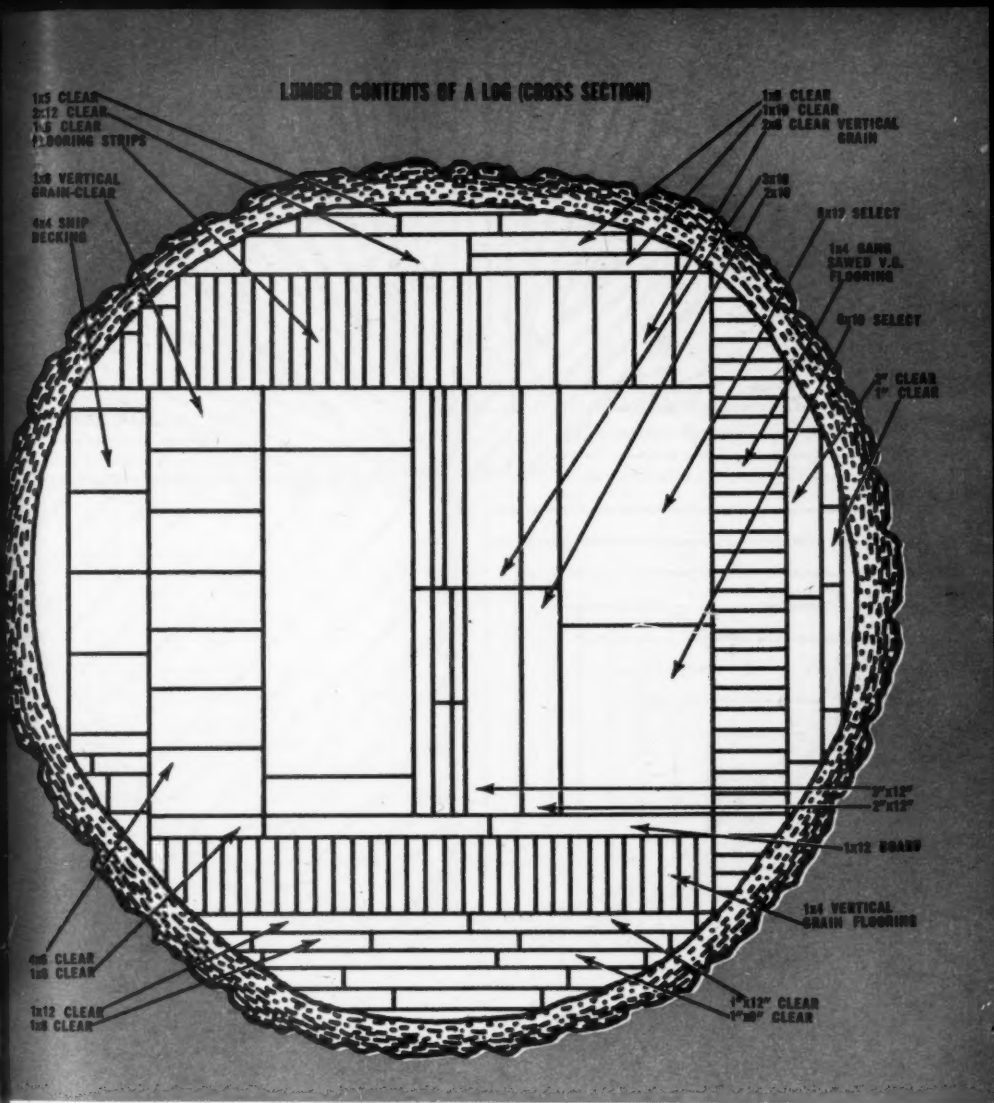
HARDBOARD will bridge small irregularities in subflooring, make smooth and rigid surface on which to lay finished flooring of any type.



SMALL WAD of steel wool is a handy thing to have in your tool box for removing rust. Keep it in 35mm film can.

HOW TO BUY LUMBER

Save as much as 50 per cent on lumber costs by learning the classifications and grades of wood.

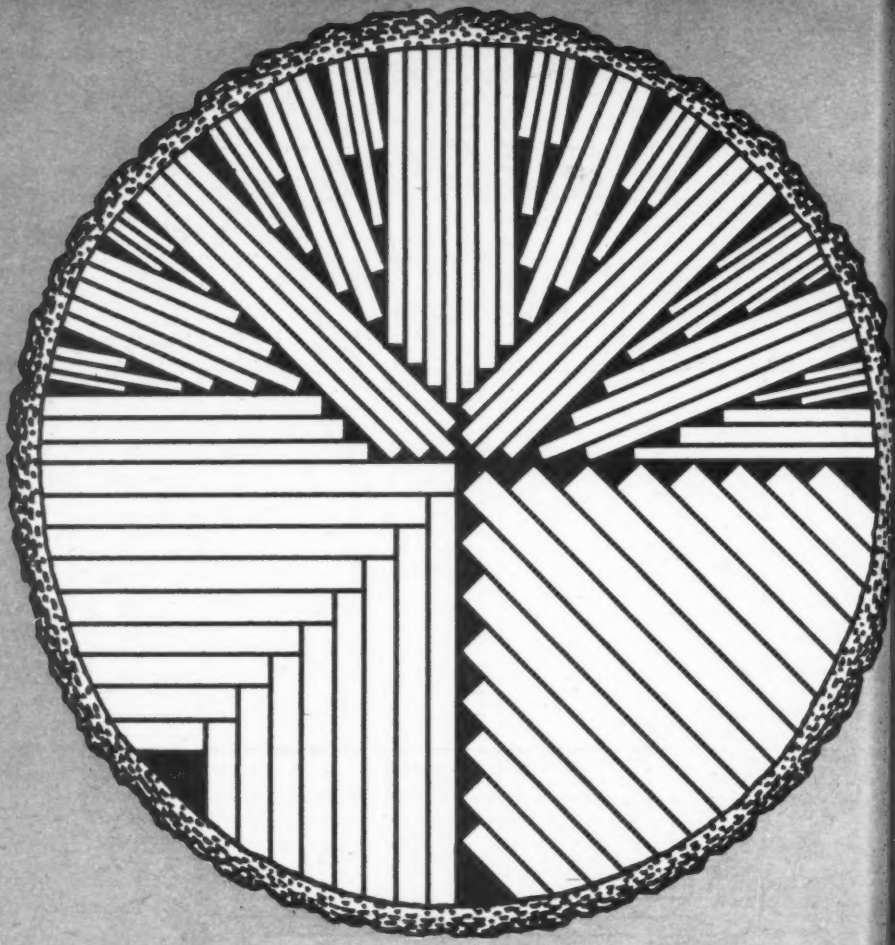


By H. Robert Beasley

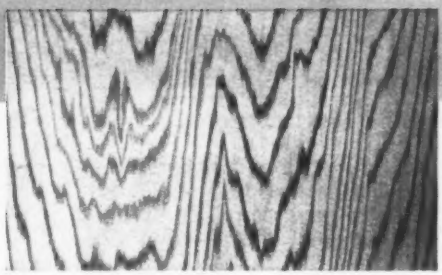
BECAUSE the home craftsman uses wood so extensively, it constitutes a major part of his expense. But all too frequently a good percentage of this money is wasted through improper ordering and selection of material. The National Lumber Manufacturer's Association estimates that many home craftsmen can save as much as 50 per cent of their lumber costs by becoming better acquainted with the classifications, grades and uses of wood.

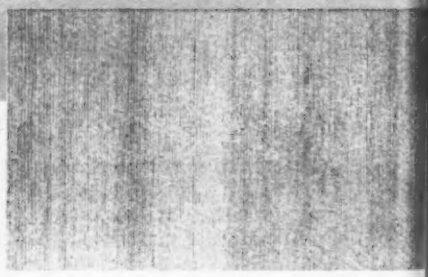
CLASSIFICATIONS

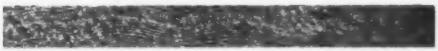
All wood falls into two general classifications. It is either softwood or hardwood. Contrary to popular belief, these terms don't neces-



QUARTER-SAWING A LOG (CROSS SECTION)

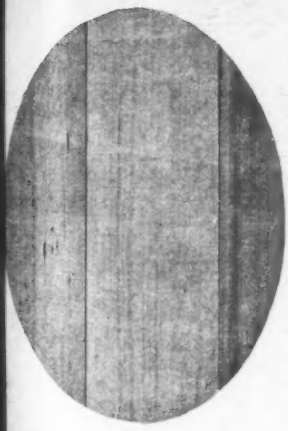




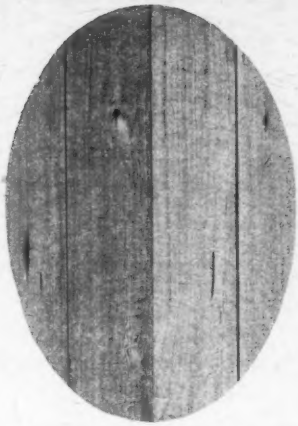


GRADE A RED CEDAR is shown above. Flat-grained stock (left) is contrasted with vertical grain stock (right). Both are suitable for a natural finish. The end grains appear below.

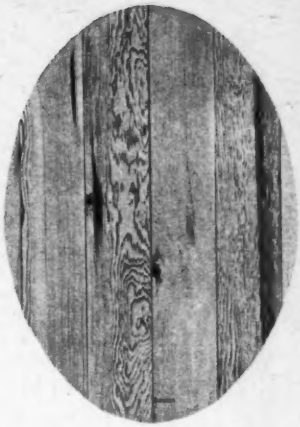
Photos by West Coast Lumberman's Association and Weyerhaeuser Lumber Company



RADE B or better lumber clear and best to buy if natural finish is desired.



GRADE C may have slight defects on both sides though one side is generally quite clear.



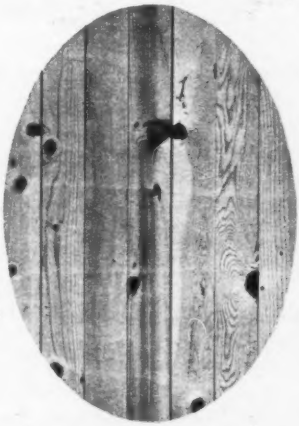
GRADE D has defects on both sides but it takes paint well. In this case, grain is mixed.

sarily apply to the softness or hardness of the wood. For example, yellow pine, a softwood, is actually much harder than some of the hardwoods. Generally, however, hardwoods have a closer grain and are harder to dent with fingernail pressure than the softwoods. All softwoods come from the coniferous or needle-bearing evergreens such as fir, pine, spruce and cedar. The hardwoods come from the broad-leaf deciduous trees which shed every year. Examples are oak, maple, birch and elm.

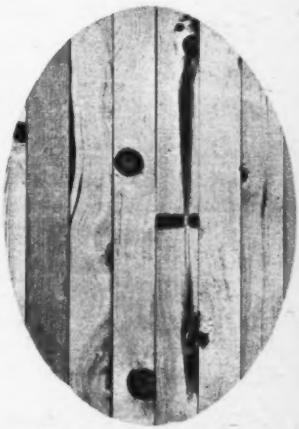
GRADING

There is a nationally-accepted method for grading and marking lumber. Known as the American Lumber

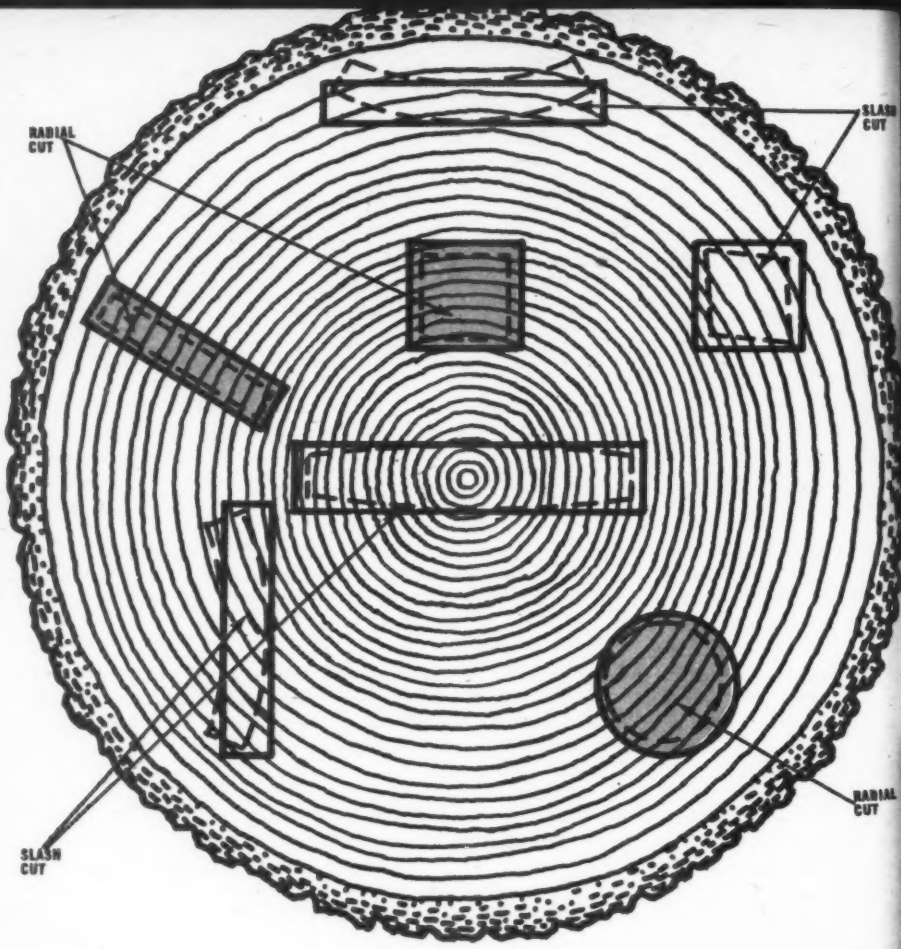
O. 1 dimension lumber is ed in construction. Minor ws don't affect strength.



NO. 2 dimension lumber, also called "Standard," may be used in erecting light framing.



NO. 3 dimension lumber, also called "Utility," has many defects but is used in building.



ONLY RADIAL CUT PIECES TEND TO SHRINK EVENLY

Standards, it sets forth general limitations on size, quality and manufacture which are rigidly observed by all reputable lumber mills and dealers. Various association grading rules differ somewhat but all fall within the framework of ALS requirements.

All lumber is generally graded as either *Select* or *Common* stock with various subdivisions of each grade denoting the degree of quality. Select lumber is clear and graded for fine finish work. It is carefully planed and is usually protected from the elements by storage under cover. Common lumber contains numerous irregularities and is usually not suitable for finishing. The primary use is for construction and utility purposes. Frequently, perfect short boards can be obtained by buying this grade and cutting the defects out. This grade is sometimes called *Yard Stock* or *General Utility* lumber.

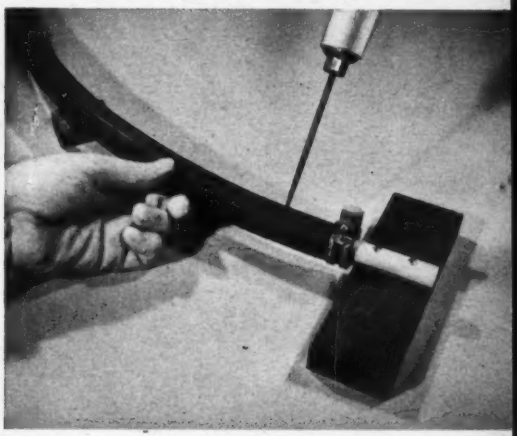
DEFECTS commonly found in lumber are as follows:

Knots occur where branches grow from the tree. They may or may not weaken the lumber, depending upon how or where it will be used.

Splits and Checks. Separations at the ends of the wood are called splits while checks may [*Continued on page* 148]

GARDEN TIPS

CONCRETE SLAB is shaped to form a rose bush planter and also to divert, away from the house, rain water from the downspout.



LAWN SPRINKLER can be made by plugging one end of hose as shown, then puncturing holes along the top and sides of the hose.

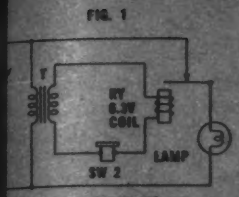
SPARE THE GRASS whenever you have to dig around the lawn by putting loose fill on a burlap bag spread out on the ground.

TRANSPLANTING shrubs becomes a less laborious chore if you wet down the soil around them before trying to dig them up.

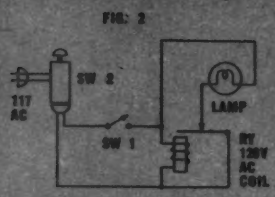
AUTOMATIC BATHROOM LIGHT

A relay switch turns the bathroom light on as you open the door, then douses it as you leave.

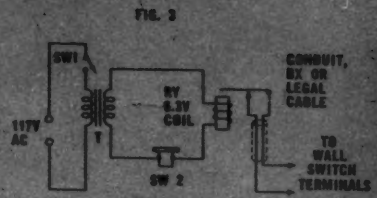
By Harvey Pollack



OW VOLTAGE SWITCHING SYSTEM
SING PLUNGER SWITCH AND
.3 V STEP-DOWN TRANSFORMER



HIGH VOLTAGE SWITCHING SYSTEM
USING EXTERNAL DOOR SWITCH
(ONLY FOR DOORS THAT OPEN OUTWARD)



CONNECTIONS FOR USE OF WALL SWITCH
AND NORMAL BATHROOM LIGHTING
FIXTURE

THIS cycled automatic bathroom light switch provides a safeguard against the hazards of accidents in a dark room and does away with fumbling for switches or pull-chains on lighting fixtures.

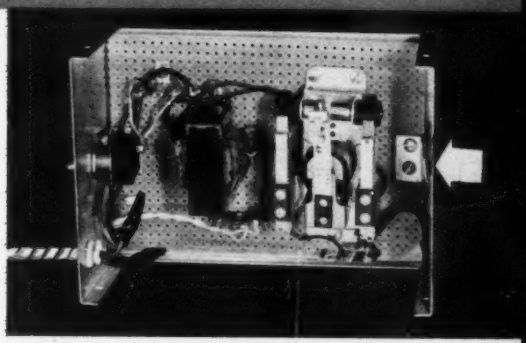
As you open the door, the light comes on; close it and the light stays on. When you leave, the act of opening the door extinguishes the light and keeps it off when the door is closed behind you. The parts for this switch are available through radio supply houses. The total investment comes to less than $10. It can be installed in one or two evenings.

The switching system described (see Fig. 1) utilizes a recessed plunger-type of switch designed for doors that open either inward or outward. This switch *must be used with low-voltage lines* since its exposed parts would represent a shock hazard if it were run to a 120-volt line. This system operates a separate lamp that is independent of the usual medicine cabinet light.

With doors that open outward you can use the less expensive "closet"-type switch (Fig. 2). Completely enclosed, this switch meets UL requirements for 120-volt home devices and you can omit the 6.3-volt transformer required with the plunger-type switch.

In ranch-type homes offering easy access to basement or attic junction boxes you can control the existing light by tying into the bathroom switch line (Fig. 3).

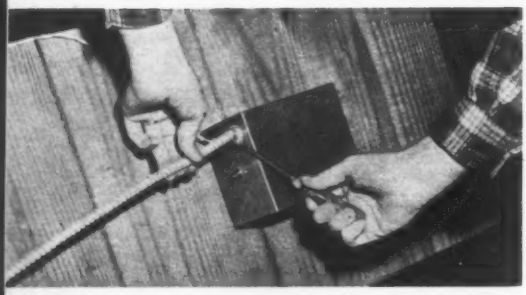
The arrangement shown here uses a 3x5x7-inch aluminum Minibox housing an impulse locking relay and a small 6.3-volt stepdown transformer. All parts are mounted on a piece of perforated Bakelite. Two small aluminum brackets —two of their corners bent to form a pair of sharp "rabbit ears"—serve to dig



SWITCH is mounted on perforated Bakelite. Form "rabbit-ear" clamps by bending corners in toward Bakelite back (see arrow).

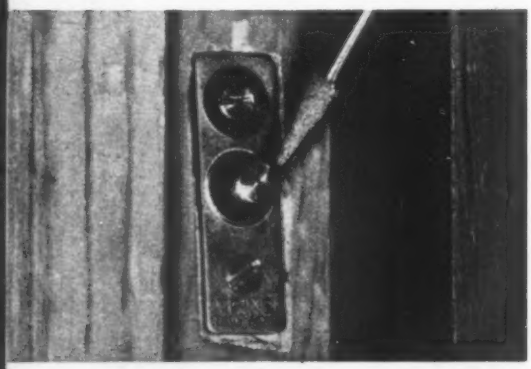
MINIBOX cover is screwed between rafters before switch section of box is fitted on.

into the Bakelite switch mounting and hold it firmly in place in the box. Most of the preliminary wiring can be done before the mounted switch is inserted in



BX CABLE is used to lead in power line, and annunciator wire to connect the switch.

RECESS switch in door frame. The wires loop around wood screws that fasten unit.



INSTALLATION of recessed plunger switch is shown above; pencil points to plunger.

the protective cover of the Minib

Switch Installation. Install the do switch by drilling a half-inch hole ab one inch deep in the door frame ju below the top hinge. Enlarge the h with a rat-tail file so that plunger a leaf-contact can enter without bindi Insert the switch, outline its edges wi a pencil, then chisel the hole to $2\frac{3}{16}$-in depth. Lead the feeder wires to t switch through shallow grooves or fi holes drilled through the door fram The use of 6.3 volts for relay energi tion permits ordinary annunciator wi to be used for connecting the switch.

If you use the closet-type switc mount it according to the manufa turer's instructions, then follow t wiring diagram given in Figure 2. Th installation does not use a transforme but you will need a relay with a 120-vo AC coil as shown in the diagram.

The wiring changes required f using the relay box to control an exis ing bathroom fixture are illustrated i Figure 3. In this hook-up the relay co tacts are connected in parallel with t wall switch, thus making it possible t control the light either automatically o manually. Check local wiring codes t be certain this installation conforms t them. •

PARTS LIST

FIGURE 1.

Case—Aluminum Minibox, 3"x5"x7", Bud CU-2108.

Relay (RY)—Potter & Brumfield Impulse Locking lay, 6.3 V coil, DPDT type AP11A; or Potter & field Rocker Latching Relay, 6.3 V coil, DPDT, PC11A.

Transformer (T)—Step-down type, 120 V to 6.3 1 amp.

Perforated Bakelite Sheet—One piece 6¾"x7⅜".

Terminal Strips—Three, to hold terminals of entering and leaving case.

Switch (SW-1)—SPST toggle switch.

Switch (SW-2)—Recessed plunger door switch.

Miscellaneous—Light bulb, socket, wire, fittings,

FIGURE 2.

Switch (SW-2)—Closet-type door switch.

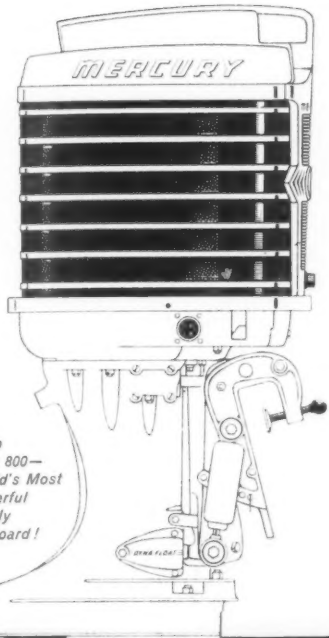
Switch (SW-1)—SPST toggle switch.

Relay (RY)—Potter & Brumfield Impulse Locking Re 120 V AC coil, DPDT, type AP11A; or Potter & field Rocker Latching Relay, 120 V AC coil, DP type PC11A.

FIGURE 3.

Same as Figure 1 except for change in wiring of re

MERCURY is the world's No. 1 outboard in Power!



80 hp Merc 800— World's Most Powerful Family Outboard!

Of all outboards on the market, *only* a Mercury has enough thrust to lift five times its own weight! That's why Mercury's 70 hp Merc 700 is outperforming 75 hp competitors. Mercury gives you the widest useful operating range and the greatest reserve power above normal requirements.

The reason is Mercury's modern *in-line* engine design, with smaller, lighter, tougher reciprocating parts and much lower piston speeds than long-stroke "big-bore" engines. Mercury's small-bore, short-stroke design not only develops usable power throughout a wider speed range but reduces inertia forces — the main cause of engine wear — to only about one-third those of competitive outboards operating at the same RPM! The result is bonus power and performance with longer engine life.

See your Mercury dealer for a demonstration of power no other outboards can touch — 6 to 80 hp, in twins, fours and sixes.

***Write for free booklet*, "An Introduction to Outboarding".**

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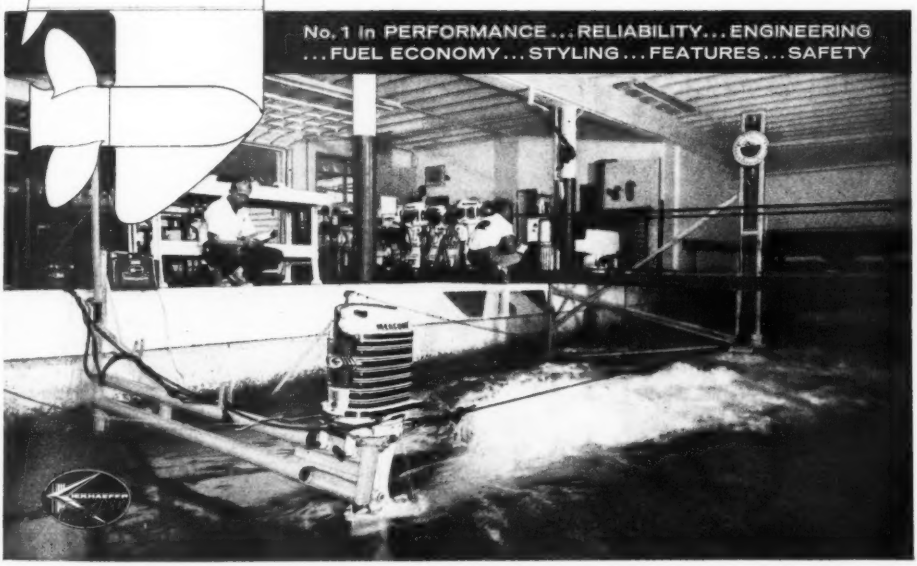
Below — Static thrust testing proves that a Mercury can lift five times its own weight!

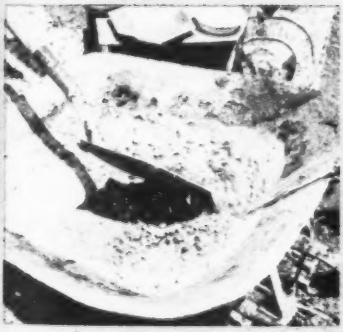


FREE HI-FI TEST RECORD IN THE JUNE ISSUE OF EI*

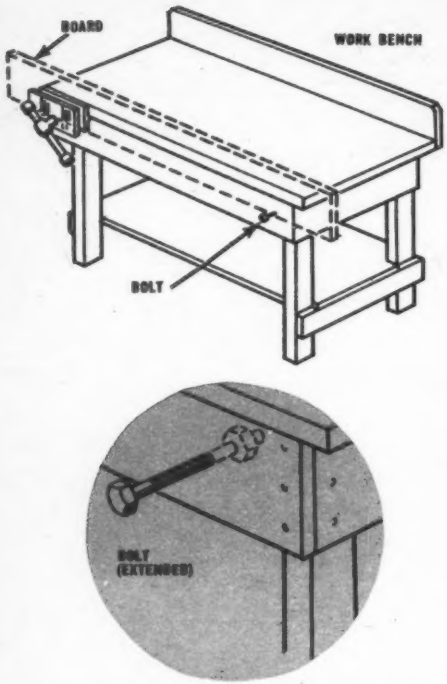
*ELECTRONICS ILLUSTRATED
On Sale At Your Newsstand • 35¢

GARDEN STEPPING STONES

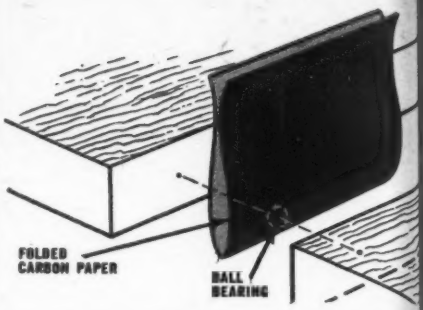
A MIXTURE of sand and gravel, a sack of cement and some water will make all the stepping stones needed for an average garden—and you can make them in any shape or form with the variety of aluminum cake pans available. Just prepare the mix in a wheelbarrow, using six shovels of gravel to every three of sand and one of cement, and add water slowly until you have a smooth working consistency. Then level the concrete in the pans with a shovel, smooth it with a trowel, allow at least 24 hours curing time and you're ready to lay out an attractive walk. •



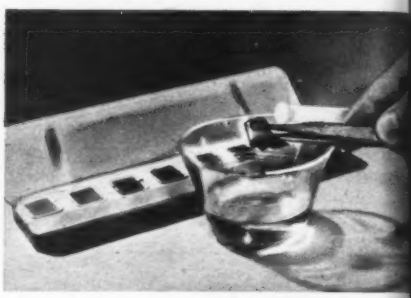
MIX sand, gravel and cement thoroughly and add water slowly until you have a stiff but workable consistency. Then shovel concrete into greased pans and trowel it smooth. A color pigment may be added.



LONG STOCK can be supported in a vise with the aid of a sliding bolt fitted in the workbench as shown in above drawings.



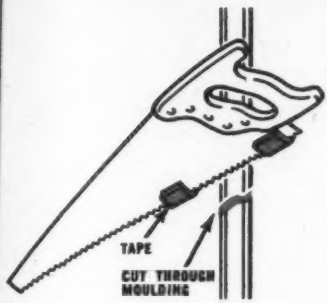
BALL BEARING in fold of carbon paper marks points for facing dowel holes; carbon marks the stock when it's tapped together.



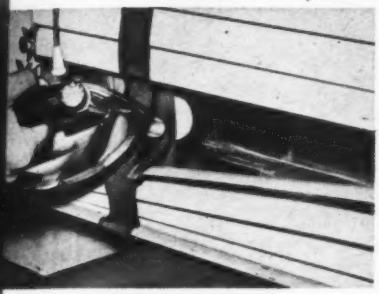
MAKE YOUR OWN colored poster ink by the simple expedient of dissolving a cake of ordinary water color in a cup of water.

SHOP SHORTS

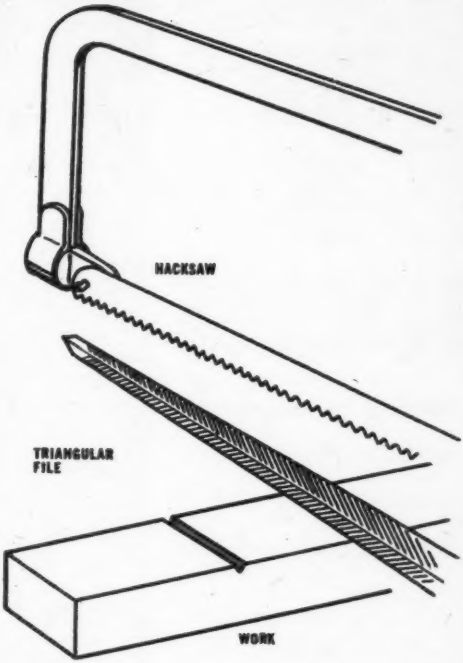
FREDDIE FUMBLES



ADHESIVE TAPE put over saw teeth as shown permits sawing through surface moldings without damaging walls.



NO NEED to take down your Venetian blinds if you use one of the iron-on mending tapes to fix broken webbing.



PROTECT metal stock from the unwanted nicks caused by a sideslipping hack saw by starting all hack-saw cuts with a small triangular file.

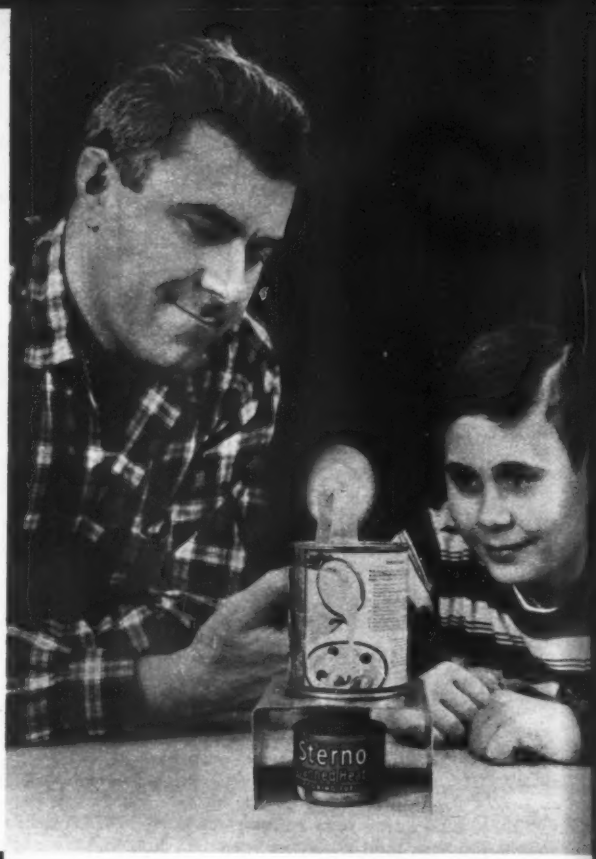
Send Freddie Fumbles your idea of a good short-cut, time-saver or safety device in your work, whether it be in the home, shop, office or farm. Each tip accepted will be paid for at the rate of $10. Naturally we cannot acknowledge or return the ones we cannot use. However all will be carefully read and evaluated. (Those which we can use in other departments of MI will be paid for at our regular rates.) Please send in your ideas on a postcard only. Address to Freddie Fumbles, *Mechanix Illustrated*, 67 W. 44th St., New York 36, N. Y.

Thanks: ABE SLIKUM LOUISVILLE, KY.

FUN IN SCIENCE

Make a model steam turbine from three needle valves and a couple of tin cans.

By H. McDougall

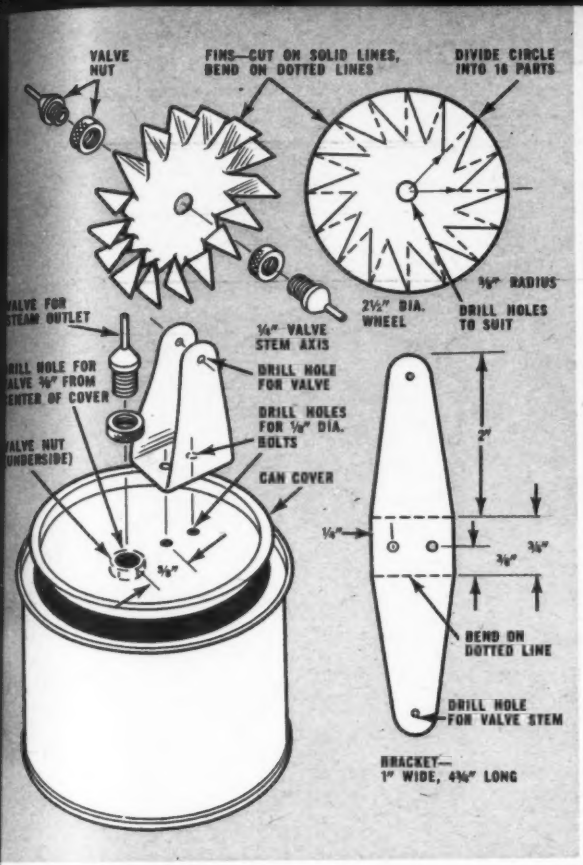


NEEDLE VALVE in lid of can directs jet of steam against vanes to drive turbine wheel.

THE steam turbine finds its principal application in ships. Its main advantage, besides its efficiency, is that it converts steam pressure to rotary motion without use of reciprocating parts and this makes it comparatively free from vibration.

This little model demonstrates the principle of the steam turbine. It costs less than a dollar to build, involves no soldering and can be whirling merrily within a couple of hours after you start work.

You'll have to buy three needle valves of the kind used to inflate footballs and four suitable nuts. The valves can be obtained at any sporting goods store but you may have to visit a bicycle repair shop for the nuts. The boiler is simply a can with a press-fit lid. We used a custard can but a paint can or anything similar would do. The press-fit lid is important because it acts as a safety valve; if the pressure gets too high, it will lift and allow the steam to escape. Thus there is no danger of the can blowing up.



The turbine wheel is made from another tin can hammered flat. Scrap aluminum is even better because it is lighter and easier to work. Mark out the wheel as shown, center and drill the hole and then cut and bend the blades. Next outline the bracket and drill the holes for the shaft and the attachment bolts before cutting and bending it to shape. Use the bracket to mark the positions of the bolt holes in the lid of the can and drill them too. Last, mark and drill the holes for the jet which should be about ⅞-inch from the centerline of the turbine wheel.

The shaft for the turbine wheel is built up from two needle valves and two nuts. Thread a nut onto one valve and then add the turbine wheel. The thread must project only enough to go halfway through the nut on the other side of the wheel. To cut off the excess, estimate the number of threads that must be removed, take off the turbine wheel and the nut and grip the valve in a metalworking vise by the part that is to be discarded. Then use a fine-tooth saw to remove the unwanted material and clean up the end threads afterward with a fine file. Put the wheel back on the valve and then add the nut on the other side of the wheel. If you've cut the valve correctly, there should be just enough threads remaining inside this nut to accept the other valve. The second valve, in turn, must be cut short so that it has only enough threads to penetrate halfway through the nut and butt up against the end of the first valve.

Having completed the turbine wheel assembly, all that remains is to slip it into place and trim the projecting ends of the shaft with diagonal cutters. Since the shaft is tubular, this will also squash the ends and keep them from pulling back through the holes.

The remaining valve is used for the jet. Cut it to a ⅝-inch length with a fine-tooth saw (not the cutters) and file the end flat, taking care not to burr the end. Check to see that it is clear inside and remove any fine chips with a needle.

Make a simple stand as shown, the dimensions depending upon the size of the can. Use Sterno or a hot plate for the "furnace." Half fill the can with hot water and press the lid into place. Flick the wheel to make sure it has clearance and then turn on the heat. As soon as the water boils, the jet of steam will drive the wheel at surprising speed—a graphic demonstration of the principle of the steam turbine. •

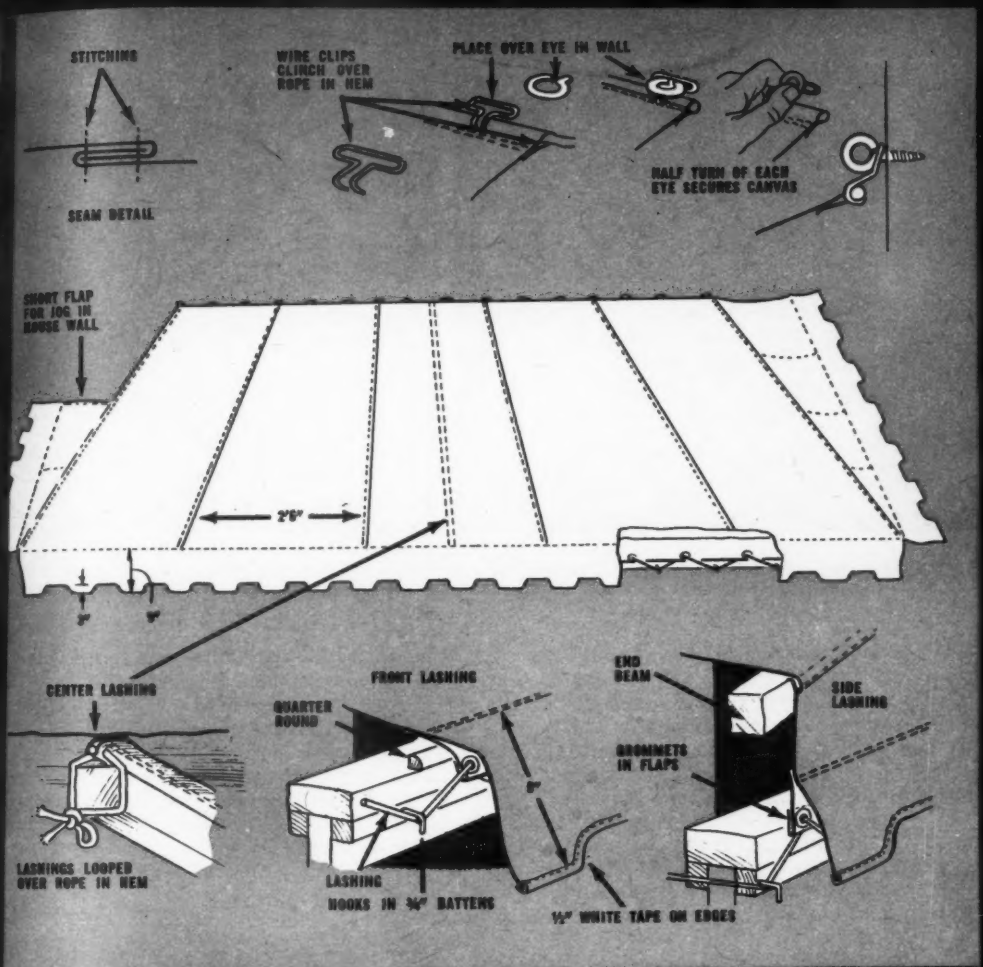
SCREENED *Terrace*

A SCREENED terrace will make your summers more enjoyable and add living space to your home. It's ideal for cool dining and, fitted with bamboo blinds, offers enough privacy for sleeping. The terrace described here can be built of low-cost materials, is easily dismantled for winter storage and can be adapted to almost any space.

The best place to locate the terrace is on a shady side of the house. An ell or wing of a house is a natural spot for the terrace because fewer screen panels are required.

This terrace measures 9x12 feet. Although you can make your terrace any size by adding more panels and extending the beams, rails and sills, don't go beyond a 12-foot width or the awning beams will sag.

The foundation is about two inches above ground level and consists of con-



CONCRETE blocks on sand form terrace floor. Note half-inch joints between blocks.

COMPLETED TERRACE FLOOR as it looks prior to the erection of the framework.

DETAIL of bottom sill at corner block. Top strips form channel for the screens.

BOLTING notched front end of one of the awning beams in place over the front rail.

crete slab blocks laid in a sand bed over a layer of gravel. The larger concrete blocks at the corners and front center act as anchors for the sills.

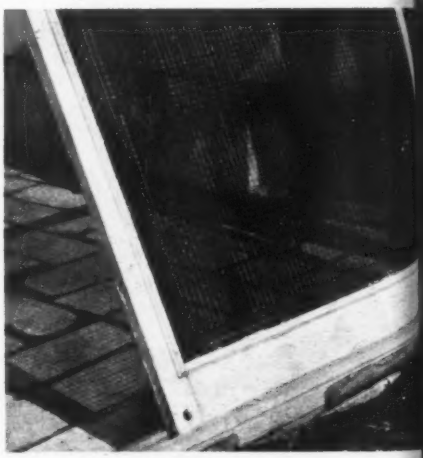
After the space has been excavated to a depth of about 15 inches the corner blocks are set in place. Make sure these are about one inch lower than the level of the terrace next to the house so there will be enough pitch for drainage. Spread gravel at the bottom of the space and place a row of blocks around the edge with mortar between the joints. Add sand to within 1½ inch of the top, then level it off and lay the blocks flat on the sand leaving a 1½-inch space for joints between them.

Next, cover the blocks with a light layer of wet sand and sweep it into the spaces between them adding sand until the joints are filled. If one or two blocks don't lie perfectly flat, raise them, level the sand underneath them and relay them.

The screen framework is made of 2x4's with 1⅛-inch stock for the corner posts and screen panel frames. The height of the panels should be about 7½ feet for the average home. Use carriage bolts to fasten the members together and bolt the sills to the corner blocks in the ground using lag screws turned into expansion shields in the blocks. The small panel over the door is held in place by metal straps screwed to the members on either side.

The screen panels fit into channels in the top rails and bottom sills which lock them firmly in place. The holddown blocks on the corner posts keep the awning frame from lifting off the sides.

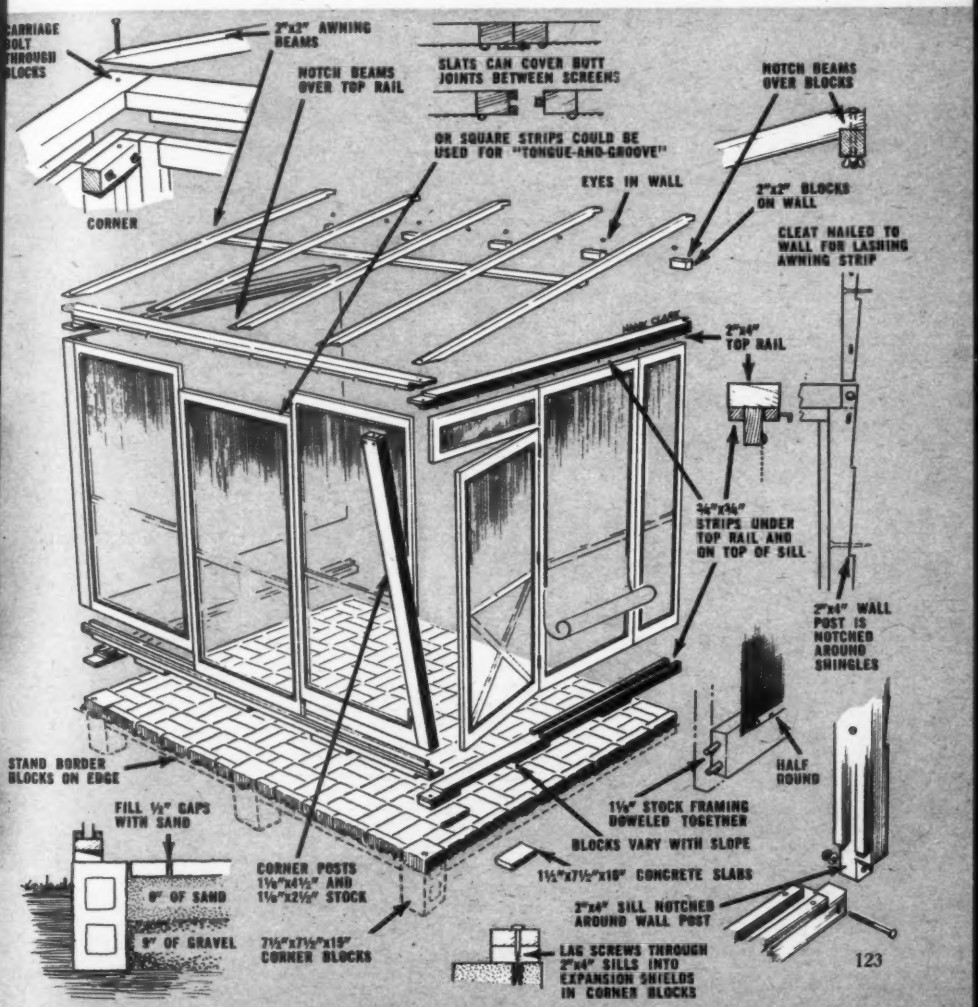
It is suggested that you have your awnings made by a shop specializing in canvas work. [*Continued on page* 134]



SCREEN FRAMES slip into channels along underside of top rail and at top of sill.

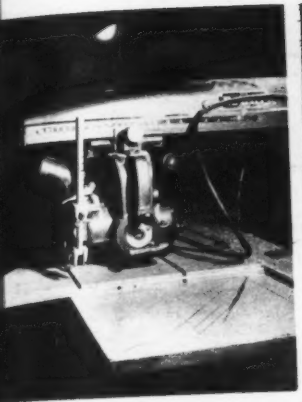
CANVAS AWNING is lashed securely to the framework at front, side and center beams.

COMFORTABLY COOL terrace can serve as a bedroom if bamboo blinds are installed.

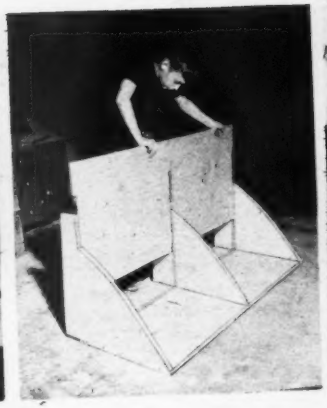


FAMILY HOBBY TABLE

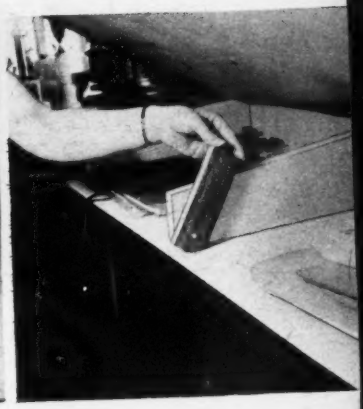
HERE'S a hobby table that's hard to beat for sturdy and simple construction—and it can be finished in four hours. At an angle, the top is good for writing; leveled off, it makes a fine working surface for the hobbyist. All you need is a sheet of ¾-inch plywood for the top, back and sides, some quarter-inch ply for the shelves, a piece of pine and a piano hinge. Cut the pieces to the dimensions shown in the drawing and assemble them with glue and screws. Then paint the unit, screw it to the wall studs and sit down to your business or pleasure.—*Hal Kelly*



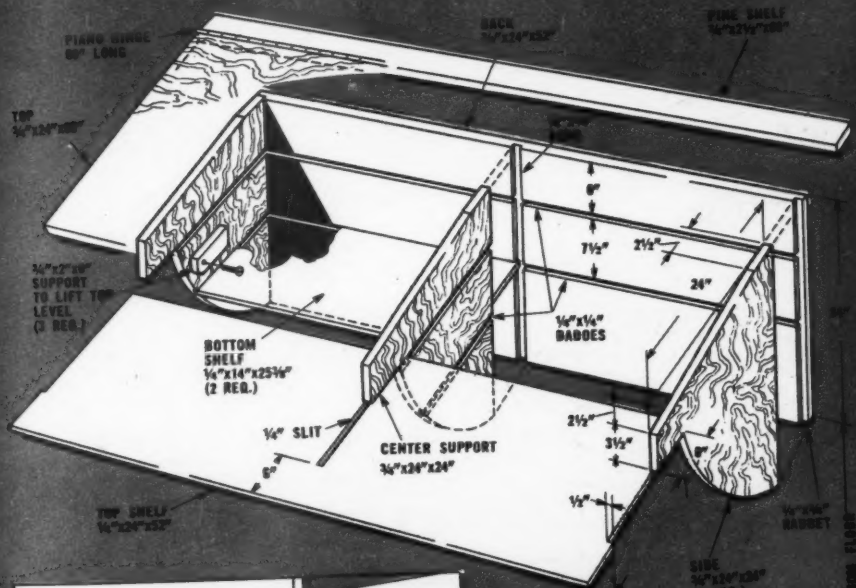
DADO ¼-inch deep is cut on both sides of center support for upper and lower shelves.

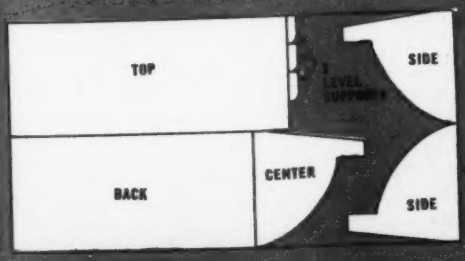


TOP SHELF has ¼-inch slot in center, slides into dadoes cut in the vertical supports.

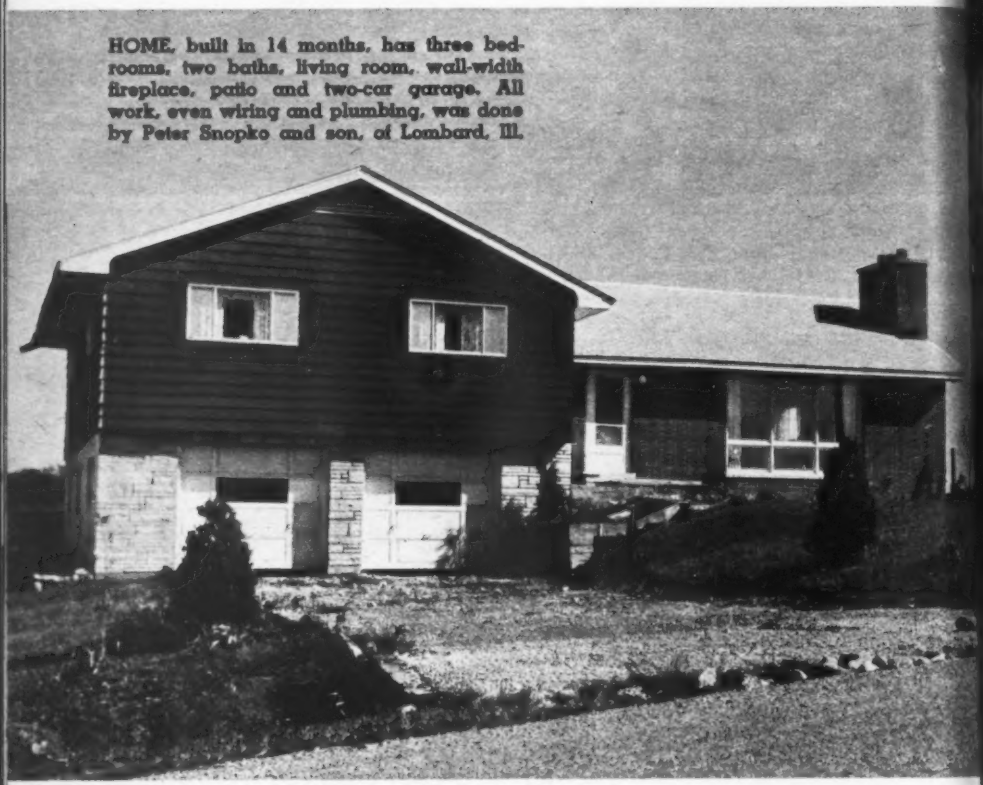


BLOCKS, rounded on one corner for a flush pivot, are raised to level table.





Golden Hammer Award Winners



HOME, built in 14 months, has three bedrooms, two baths, living room, wall-width fireplace, patio and two-car garage. All work, even wiring and plumbing, was done by Peter Snopko and son, of Lombard, Ill.

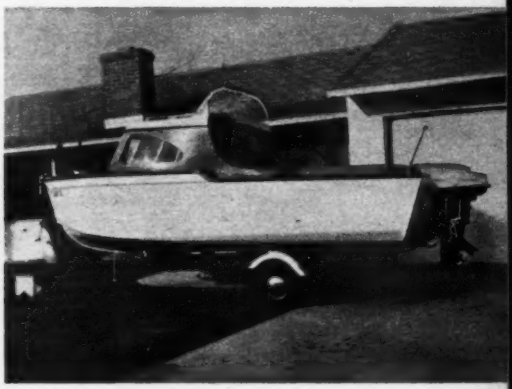
The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their projects: Charles Bowser, Philadelphia, Pa. . . . Edwin T. Sack, Jr., Baltimore, Md. . . . Richard D. Saxton, Whitehall, Mich. . . . Jay Price, Lake City, Mich. . . . Don E. Stiner, Loveland, Colo. . . . Anthony Montebello, Powell River, B. C., Can. . . . Robert M. McCartney, Atlanta, Ga. . . . Al Becker, Inglewood, Calif. . . . K. S. Froland, Eugene, Ore. . . . W. J. McBride, San Jose, Calif. . . . Kenneth Karschney, [Continued on page 138]

Each craftsman whose project is shown receives a 24-karat gold-plated Hammer and a Workbench Award Certificate. Runners-up will be sent a beautiful gold-plated Golden Hammer Tie Bar or MI's Certificate of Merit. So send us some *black-and-white photos, with negatives,* and a full description of your latest project. Photos of your workshop are also eligible. Send all entries, with return postage, to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th St., New York 36, N. Y. Entrants are advised that MECHANIX ILLUSTRATED cannot accept responsibility for customs charges, duties, taxes, etc., levied against Golden Hammer and Golden Hammer Tie Bar winners outside the United States.

SHIRLEY WHITE of Lubbock, Tex., stands by the plane her husband Van built in 18 months of work. Ship cruises at 140 mph.

MIDGET RACER was assembled from spare auto parts by William De Platchett, Erie, Pa. It does 45 mph with air-cooled engine.

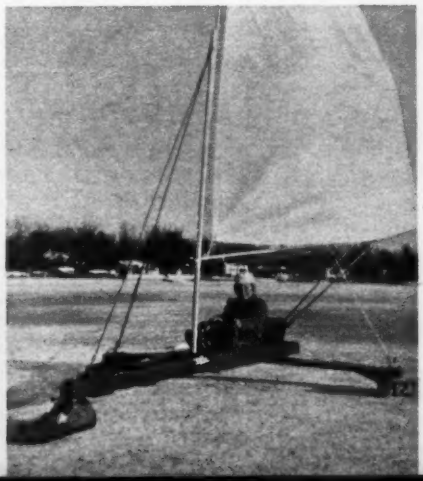
OPEN-COCKPIT craft has 23-ft. wingspan, 65-hp engine, has been flown over 19 hrs. by builder Larry Traver, Faulkton, S. Dak.



16-FT. CABIN CRUISER was built in 3½ months from MI plans. Total cost to R. E. Cash, N. Highlands, Calif., was only $355.

BREAKFRONT is just one example of the fine hardwood furniture designed and crafted by Henry Fey of Arnstein, W. Ger.

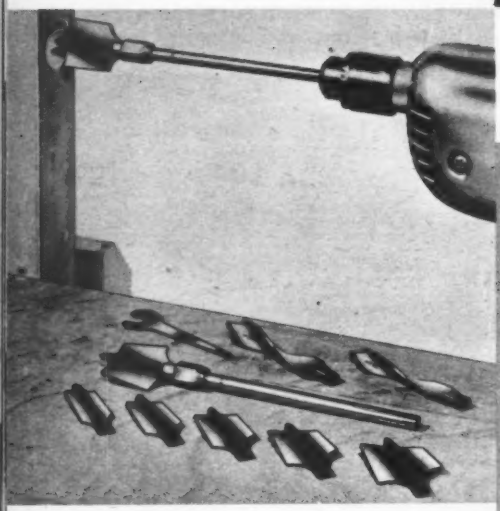
FROST FISH, an iceboat constructed from MI plans by Don Johnson of E. Greenwich, R. I., was completed in about three weeks.



MI's HARDWARE STORE

PROTECT-O-LITE photoelectric eye plugs into outlet, turns house lights on or off automatically by reacting to daylight. $15.

Energy Kontrols, Inc., 11 S. 1st St., Geneva, Ill.



TEN-PIECE SET has interchangeable bits, ⅜ to 1¼ in.; shank that bores 5¾-in. hole, special wrench. $2.95.

Arrow Metal Prod. Co., 421 W. 203 St., N.Y.C.

JIG SAW'S new "angle blade" clears chips. A high-speed tool, the saw cuts at 3000 half-inch strokes per minute. $29.95.

Millers Falls Co., Greenfield, Mass.

JIFFY GRILL comes charcoal-packed and ready to light. $3.98.

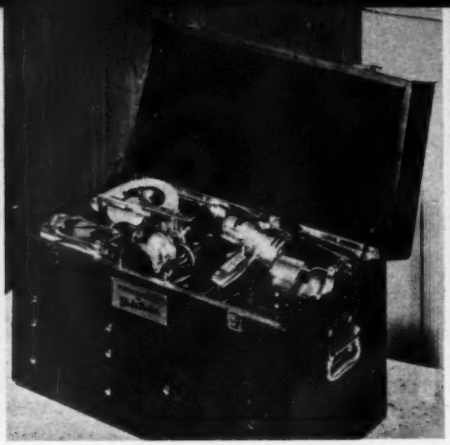
Publicity Unlimited, Box 2451 Parcel Post Sta., Tallahassee, Fla.

NEW ITEMS

Pour your own concrete "stone" facings using molds ($5 each) from Art Anson Articles, 1901 S. 12th St., Allentown, Pa. . . . A $1 Miterite tool from Miterite, Inc., P.O. Box 788, Campbell, Calif., computes compound angles. . . . Vibra-Sorb felt pads reduce machinery vibration, secure power tools to floor with special adhesive; write Vibra-Sorb Corporation, 426 Lafayette Ave., Brooklyn 38, N. Y. . . . Basement-installed Automatic Air Purifier is now available from Carrier Corp., Syracuse 1, N. Y. . . . Set tiles ten minutes after spreading new Cure-Set adhesive on floor; it's made by Borden Chemical Co., 350 Madison Ave., N.Y.C. 17. . . . Vaco Prod. Co., 317 E. Ontario St., Chicago 11, is marketing a soft-face hammer with three interchangeable tips for $4.75. . . . Rocker panel repair kit from Richline Co., Inc., Minneapolis, Minn., costs $7.95 for two-door models, $9.95 for four-door cars.

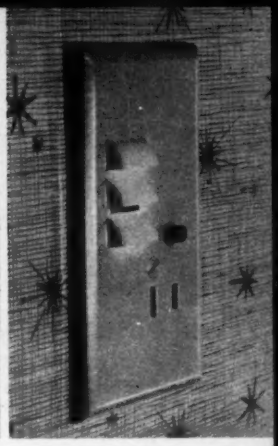
SPECIAL PLIERS speed setting and removal of auto radiator clamps.

K-D Mfg. Co., Lancaster, Pa.



DELUXE WORKSHOP in mahogany chest includes Power Driver, over 150 accessories, attachments. List price: $354.50.

Black & Decker Mfg. Co., Towson, Md.



NIGHT LIGHT installs in standard box; has a switch, 7½-watt lamp.

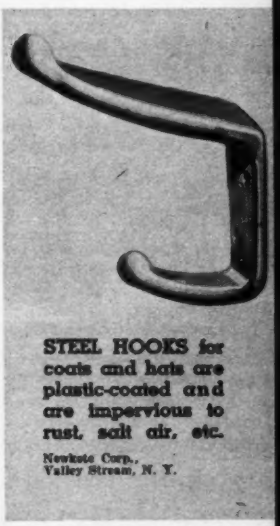
Nu Nite Lite Co., P.O. Box 424, Dayton, Ohio.

CARTER DRAIN CLEANER uses hot-water pressure to clear clogged plumbing. $3.95.

T&E Mfg. Corp., P.O. Box 87, Pasadena, Texas

NEW straight-line sander is designed for fine finishing. $16.95.

Cummins Portable Tool Div., John Oster Mfg. Co., 5865 N. Lydell Ave., Milwaukee, Wis.



STEEL HOOKS for coats and hats are plastic-coated and are impervious to rust, salt air, etc.

Newkote Corp., Valley Stream, N. Y.

RATCHET WRENCH snaps open, then locks on nut; nine sizes; has 30° ratchet action.

Imperial Brass Mfg. Co., 6300 W. Howard St., Chicago, Ill.

← **RUBBER-SILICONE waterproofing compound goes on with a brush, keeps dampness out of basement.**

Camp Co., 6958 S. State St., Chicago, Ill.

ROTATING PLANT STAND

A MING DYNASTY bowl holder inspired the design of this rotating stand which makes it easy to turn large, heavy plants for uniform sun exposure. While the basic lines of the antique were followed, elimination of some intricate carving resulted in a piece that blends well with modern or traditional surroundings.

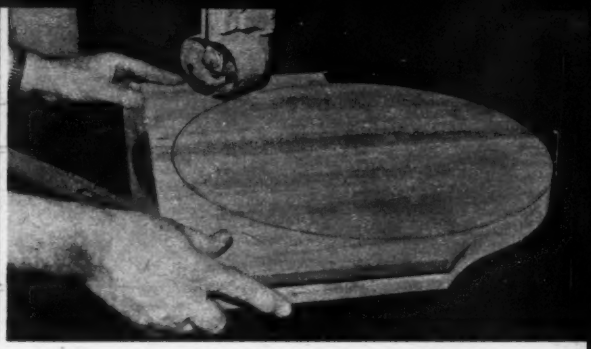
Philippine mahogany is used in construction. The legs are cut from four 1½x4x6-inch pieces, three pieces of ¾-inch stock are glued up for the top disk and three pieces of half-inch stock are glued up for the bottom one. The top disk rotates on a heavy-duty Faultless swivel turntable (Catalog No. SWV 1100) which is recessed into its underside.

Begin by gluing up the stock for the two disks and leave each section clamped until the glue has set. In the meantime, the leg pattern can be cut from Masonite and traced on the four pieces of 1½-inch stock. Then a one-inch hole is bored in each piece as indicated in the drawing [*Continued on page* 138]

PATTERN for leg shape is cut from Masonite and traced on block of 1½-in. mahogany.

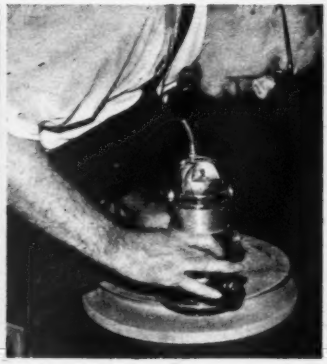
STAND is a decorative support for philodendron in Hydrocel planter.

LEGS are cut with band saw after boring hole in each as shown in drawing.



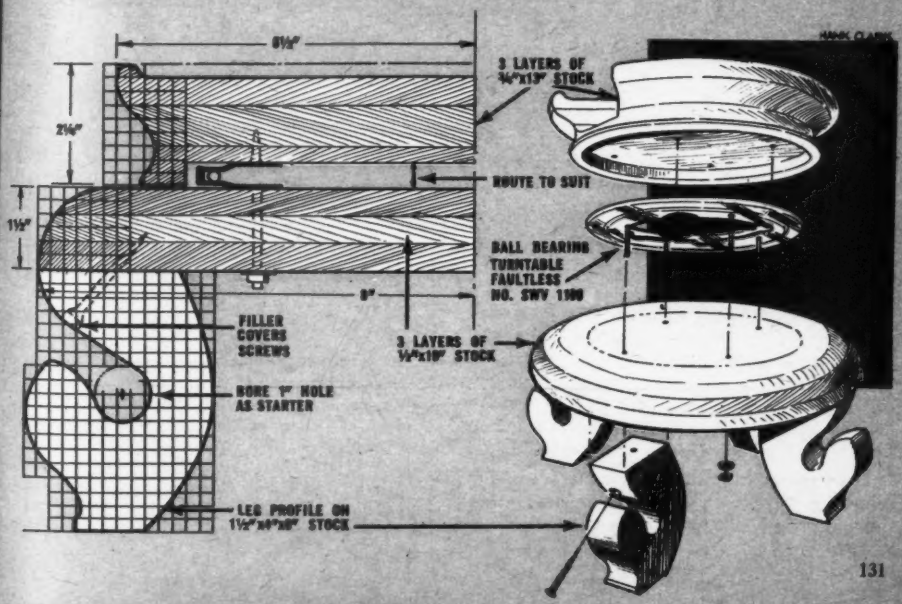
DISKS of 13- and 16-in. diameter are cut from mahogany laminated to 2¼- and 1½-in. thickness.

TURNING the upper disk to shape on a wood lathe.



RECESS is cut on each side of upper disk with a router.

WOOD is finished with a dark stain and flat varnish.



New Ideas in Photograph

These cameras give you better pictures automatically: (from left) Brownie Starmatic, Kodak Automatic 3

How the Dependable New Electric-Ey

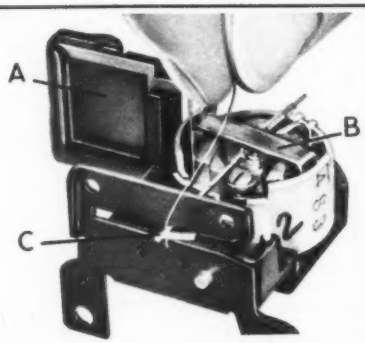
Two different systems— same picture-perfect results!

Hottest still and movie cameras today are the new electric-eye models that read the light and set their own lens openings.

For dependability and trouble-free operation, Kodak engineers have created *two* control systems—one for still cameras, one for movie cameras. You need two, because still cameras have larger diaphragms. They demand more power than a photocell can supply.

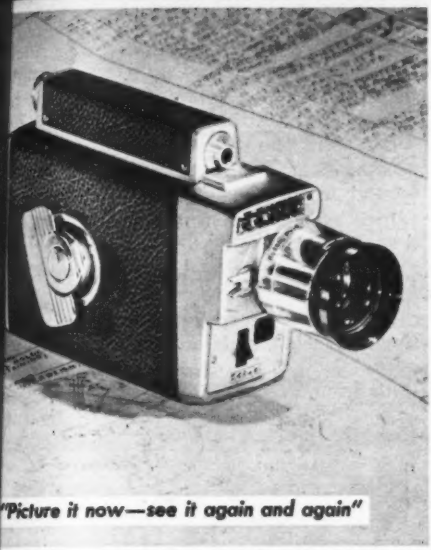
For still cameras: a control needle. Kodak and Brownie automatic still camera diaphragm movements take *no* power from the photocell. Current from the cell simply positions an exposure-control needle! And the needle position decides how far the lens will open when you press the shutter release.

The simplest of the automatic cameras working this way is the Brownie Starmatic. Shoot in bright sunlight, the lens "squints" as your eyes do.



So precisely balanced is the rugged photoelectric "brain" of the Brownie Starmatic Camera, that a human hair can be used to move the meter needle through its full range. In actual use, light on photocell (A) generates current which flows into galvanometer (B), moving the needle (C). When shutter is released, position of needle determines lens opening.

from Kodak



Kodak Cine Automatic Turret, Kodak Zoom 8.

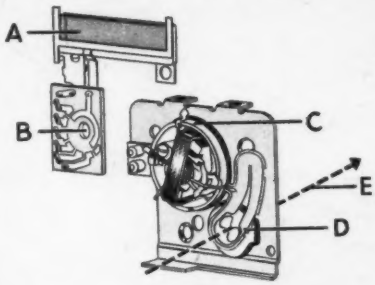
Cameras Work

Shoot on cloudy days, the lens opens up. And all automatically. No focusing. You get snapshots or slides, 12 pictures to a roll. Cost? Only $36.50 at your Kodak dealer's.

The more advanced Kodak Automatic 35 Camera has an *f*/2.8 lens, the fastest available on any automatic still camera. So it gives you more freedom in a wide range of light conditions, from dawn to sundown. For flash shots and special effects, set the camera on "manual" control and choose your own lens openings. Rapid film advance, easy loading. Costs only $89.50.

For movies: lightweight blades. Movie cameras have a featherweight, counterbalanced diaphragm directly on the meter needle (see box, upper right). The lens opening then adjusts continuously, as you "pan" across a scene.

With the Kodak Cine Automatic Turret Camera, *f*/1.9, you can follow your subject from sun to shade without stopping to adjust the lens once. You can also use the meter independently, and lock the lens diaphragm at any setting. And it can be set for faster movie films than are now available. So it will be up-to-date for years to come. Three-lens turret gives you regular, wide-angle, and telephoto shots. Only $124.50.



A teardrop-shaped diaphragm provides accurate exposure control for the Kodak Zoom 8 Camera. Light on photocell (A) generates current which goes through selector switch (B) and resistors for various film speeds. Current then flows into galvanometer (C) and swings diaphragm (D) to admit correct amount of light (E) to the film.

For the same dependable exposure control, with dramatic new zoom effects, choose the Kodak Zoom 8 Camera (Automatic *f*/1.9). You can catch your subject in motion—then zoom in for a close-up without interrupting the action or changing your position. Zoom 8 lens also takes normal, wide-angle, and telephoto views—like a three-lens turret camera. $139.50.

Ask your Kodak dealer for a demonstration.

Prices are list, include Federal Tax, and are subject to change without notice

Only a billionth H.P. operates Kodak electric-eye systems, because bearings and pins are made with "watch-jewel" precision. Bearing pins above have same .001-inch points as LP phono needle shown.

Kodak
TRADEMARK

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

SEE KODAK'S "THE ED SULLIVAN SHOW" AND "OZZIE AND HARRIET"

A big engine powers this fine classic car, the Pierce Arrow owned by Anthony T. Canino of Las Vegas, Nev.

"I always guard my classic 1929 Pierce Arrow with Quaker State Motor Oil, and my new car, too!" The powerful Straight 8 engine of this 1929 Pierce Arrow Convertible Coupe has seen many years and many miles, but its running condition today is "excellent—as good as new." One good reason: it runs exclusively with Quaker State Motor Oil. If you care for your car, old or new, compact or classic, you'll give it the long-lasting lubrication and complete protection of Quaker State. Super-refined from 100% pure Pennsylvania crude oil, the world's best. It is the finest motor oil your money can buy.

Available most everywhere . . . always ask for Quaker State by name.

For the name of your nearest dealer, call Western Union by number and ask for Operator 25.

QUAKER STATE OIL REFINING CORP., OIL CITY, PA.
Member Pennsylvania Grade Crude Oil Association

Screened Terrace

[*Continued from page* 122]

Assembling and dismantling. Numb the frames to facilitate installation wh they are taken out of storage in the spri

Lay the bottom sills in place first, che them with a level and bolt them to th corner concrete blocks which have the l screws and bolt the house ends of the si to the wall posts, which are nailed to th house. Start in one corner of the terra —next to the house—and set the corn screen panel in an upright position usi a temporary wooden brace to hold it. D the same thing for the adjoining pane until all for that side are in place.

Next, fit the top rail over the tops these screen panels and bolt it to the t of the wall post. Then the corner post go in and is bolted to the bottom sill. Repe this process for all sides of the framewor Bolt the top and bottom holddown bloc to the rails and sills to lock the structu together.

The awning beams are now bolted to th wall blocks (which have been nailed to th house) and to the top of the front rail. T tie piece under the center of the beam then bolted in place. Fasten the scre eyes to the house wall and above the wa blocks; the wire clips on the back edge the awning attach to these. Screw in th small hooks on the front edge of all the to rails. The edges of the awning are lashe to these hooks.

Make sure the awning is rolled up wi the clips on the back edge showing. La the awning roll onto the beams next to th house and fasten its back edge to the hou by putting the wire clips over the scre eyes; then turn the eyes to lock the clip Roll the rest of the awning down over th beams and lash the front edge temporari to the small hooks under the front ra Lash the center strip of the awning to th center beam and the front edge to the to rail. Finally, lash the side panels to th top rail on each side. Make sure all rope are under the hooks and securely tied.

As you use this screened terrace you find yourself enjoying it more every yea With reasonable care, the framewor foundation and awning will last man years.—*William E. Duggan*

Black & Decker celebrates 50 years of progress!

At your dealers: Golden Jubilee Drill Sale

Black & Decker says "Thanks for 50 wonderful years!" *with the sale of the year*. It makes sense to us to give you a choice of the world's most popular drills at the lowest possible prices—without budging an inch on the famous B&D-built power, speed, stamina, versatility and all-around top quality that made them the leaders in the first place. Dollar for dollar, drill for drill—*now's the time to buy!*

For free power tool catalog, write: The Black & Decker Mfg. Co., Dept. F-050, Towson 4, Md.

See "Tools-Electric" Yellow Pages for Service & Sales

B&D U-3 ¼" DELUXE DRILL. World's most popular tool for home fix-it jobs—powers sawing, sanding, polishing, screw driving attachments. Reg. Price $24.95.

B&D U-15 ⅜" DELUXE DRILL. A real workhorse for pros and semi-pros—drives up to ⅜" twist drills, ½" masonry bits, ¾" wood augers, 1¼" hole saws. Reg. Price $39.95.

50th YEAR **Black & Decker®**

World's Largest Maker of Portable Electric Tools

BUILD IT FOR YOUR BOY

A TERRARIU

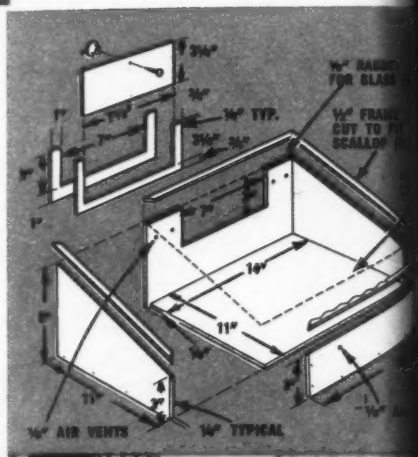
G. Lucien Geunot

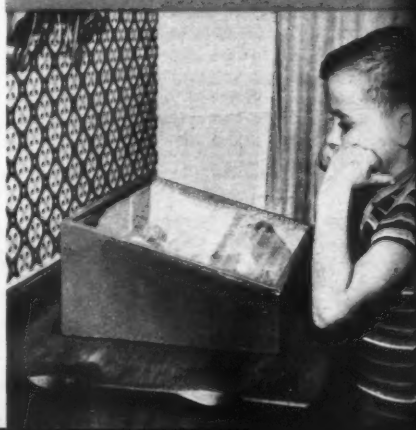
REPTILES make fascinating pets. Of course, you have to have a place to keep them. That place is called a terrarium—a little bit of desert in a glass-covered box.

All you need for this terrarium is some quarter-inch plywood and a pane of glass for the top. Following the diagram, cut the stock to size, then assemble with glue and nails. Sand smooth and apply a coat of primer paint. When the primer dries, resand lightly and apply two coats of Duco enamel. Leave the inside unpainted to retain a natural rustic effect.

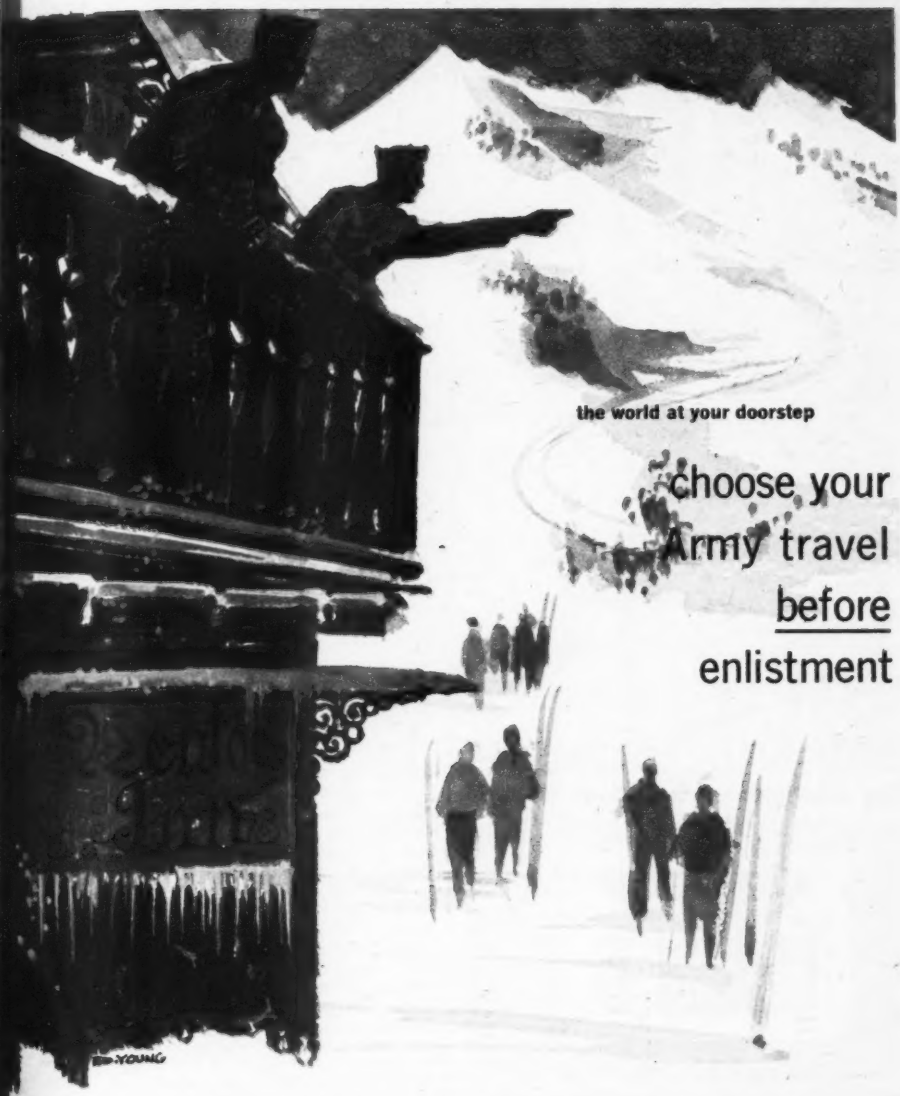
Now spread a half-inch layer of coarse sand over the floor area and landscape the box by using colorful rocks, bits of driftwood, small pots of cactus.

Lizards eat insects such as flies, ants, moths, sow bugs, etc. They love to sun themselves and should be given frequent opportunities to do so by placing the terrarium by a window. A small, shielded bulb can be installed to provide some heat and night lighting. •





EDUCATIONAL and fascinating, a terrarium makes a fine gift for any boy.



ike skiing? How about the Bavarian Alps? Swimming? ry the beautiful blue Mediterranean. Mountain climbng? Tackle the heights of Mt. Fujiyama in Japan. Today's rmy lets you **choose** the oversea area where you'll be tationed—Europe or Far East. On duty and on leave, ou'll be able to travel widely while you're there. Ask anyone who's traveled. Nothing beats the excitement of new and fascinating places. And now the Army puts them at your doorstep. So don't just dream of faraway places you'd like to see. Make your travel arrangements with your Army recruiter this week. See him—and choose your travel before you enlist!

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Southern SCREW COMPANY

SOLD THROUGH LEADING HARDWARE AND BUILDING SUPPLY DEALERS

Rotating Plant Stand

[*Continued from page* 130]

and the cutting is easily completed wi band saw. After boring the angled sc hole in each leg, sand them all sm and set them aside.

The two disks are also cut with band saw and then turned on the l to the contours shown. A router used to recess the top and bottom of upper disk. Rout the bottom to a de which will leave only $\frac{1}{16}$-inch clear between the disks when the turntabl installed.

The Hydrocel planter shown in the l illustration is a new type which h moisture twice as long as clay or wood has insulating qualities which protect plant roots from extremes of heat or c It's made in several colors and sizes Plasticrete Specialties Corp., 1883 D well Ave., Hamden 14, Conn. The p is a *Philodendron Bipennatifidum* (phant's Ear). Seeds are available f George W. Park Seed Co., Greenwo S. C.—*Clarence Martin*

Golden Hammer Awar

[*Continued from page* 126]

Vancouver, Wash. . . . Richard Rees, Willard, O . . . David E. Conner, Oregon, Ohio. . . . John Perry, Addison, Me. . . . John Bishop, Sudbury, O Can. . . . Don Armstrong, Fort William, Ont., Can. Max Goodman, Cottage Grove, Tenn. . . . Ted St Harvey, Ill. . . . A. R. Fendel, Cheyenne Wells, C . . . Emmett A. Siebers, Kaukauna, Wis. . . . A Carlson, Jr., Herlong, Calif. . . . Russell King, Rev Mass. . . . Robert Lutter, Denver, Colo. . . . Charles Neal, Carbondale, Ill. . . . George G. Borum, Centr Ill. . . . Bob Altschuler, Somers Point, N. J. . . . G Okuley, Continental, Ohio. . . . Ulan S. Anden Beach Alberta, Can. . . . Anthony S. Dixon, Mead Lands, Pa. . . . William S. Roadarmel, Elysburg, . . . Tony R. Wood, Montgomery, Ala. . . . Daniel C Sr., Elco, Pa. . . . Robert D. Peck, Berkeley, Calif. Fred S. Whitfield, Napanee, Ont., Can. . . . Bern H. Ris, Royal Oak, Mich. . . . Gene Nitzschke, L land, Ohio. . . . Alfred F. Fleury, Franklin Park, . . . Oscar Soergel, Moorhead, Minn., Raymon Bilodeau, Lewiston, Me.

The following craftsmen have been awarde CERTIFICATES OF MERIT for their project Cecil E. Wyatt, Tulsa, Okla. . . . Richard O Coytesville, N. J. . . . A. J. Smith, Salem, Wis. Herbert E. Serold, New Braunfels, Texas. . . . Hu L. Wilson, Golden, Colo. . . . R. E. Branson, Wellin Kans. . . . Cecil F. Fones, Alton, Ill.

Watch for names of more winners next mont

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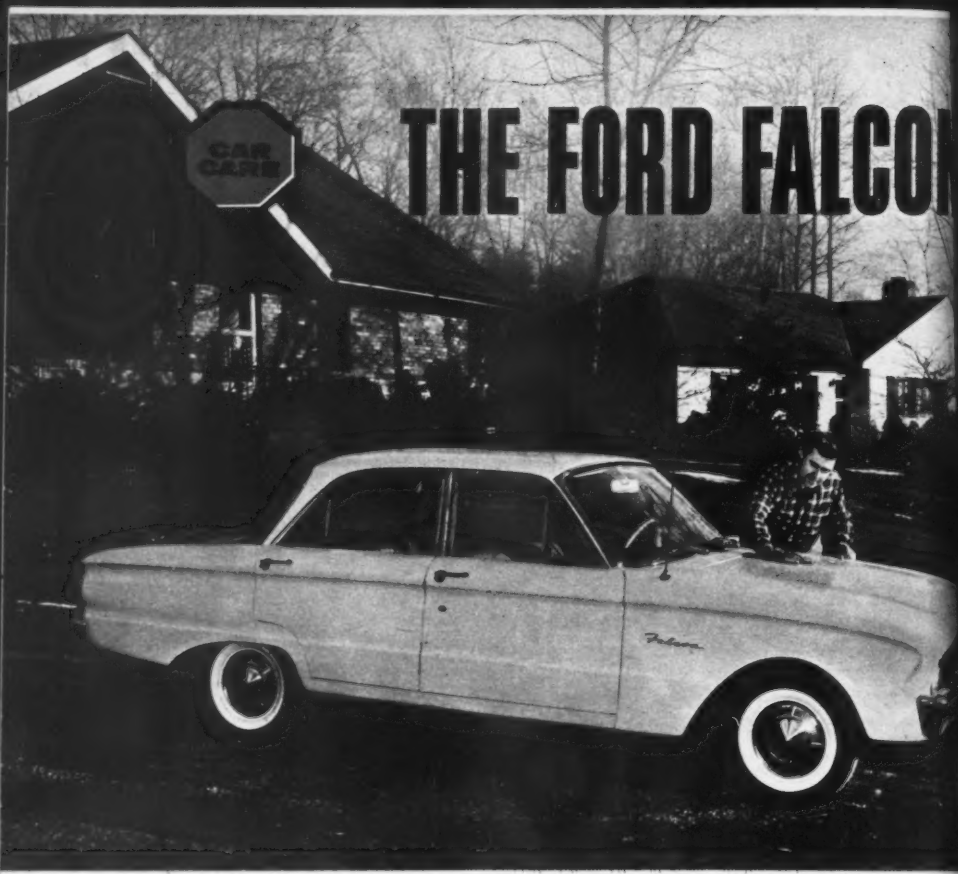
W7210 ½″ x 10′ White Clad® *$1.98.*

always look for the

LUFKIN "TARGET"

where your hardware man displays his finest measuring tools.

THE FORD FALCON



TOP-RATED by many a car tester, the Falcon is also one of the easiest cars to servic

By Frederick C. Russell

Society of Automotive Engineers

FORD'S NEW FALCON will lure the motorist who likes to do his own car repairs. That's because this compact is simple in design and construction and all its parts are easily accessible to the mechanic.

Falcon's manual transmission jobs have the shift lever on the steering post. Difficulties in shifting can usually be eliminated by adjusting the levers at the crossover; locking up indicates a worn shift housing mechanism; jumping out of gear suggests loose mounting bolts or improperly adjusted shift linkage.

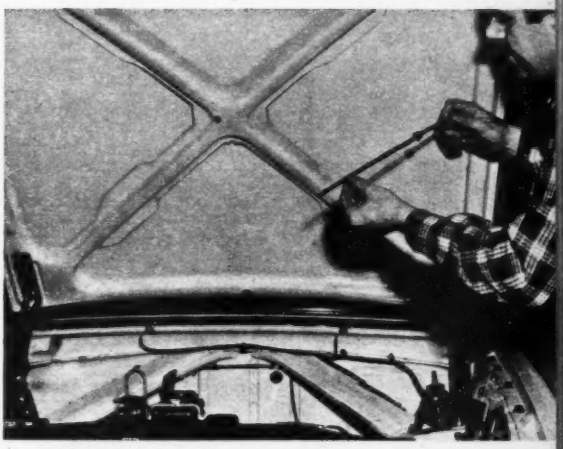
Fordomatic models as well as those equipped with manual shift should be fully stopped before shifting into Re-

CLUTCH equalizer bar on manual shift models should be lubricated every 1,000 miles.

verse, or into a forward speed while reversing. The Fordomatic transmission has only two forward speeds. Below the 50- to 55-mph range it provides extra wallop for passing and climbing hills when the transmission is downshifted by pressing the accelerator to the floor and holding it there.

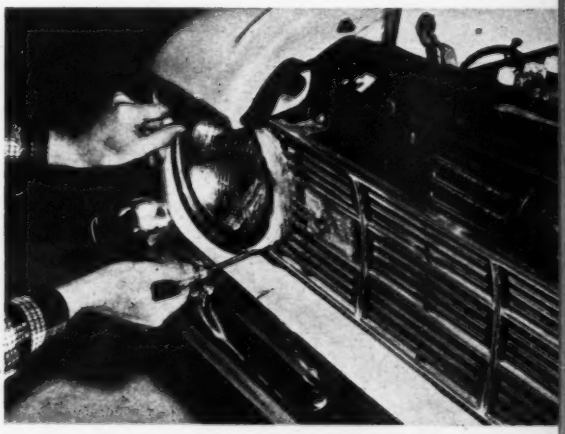
Fordomatic transmission consists of a combination of hydraulic torque converter and fluid drive combined with a planetary gear system. Its fluid level should be checked every 1,000 miles with the car on level ground and with the engine running warm at a fast 1,200-rpm idle. Clean all dirt from around it before removing the dipstick cap. Then, to make sure you didn't overfill, move the selector lever through all positions. The company holds to its policy of fluid replacement every 25,000 miles for the Falcon's automatic drive.

RUST won't be a problem if drain holes under doors and body panels are kept open.

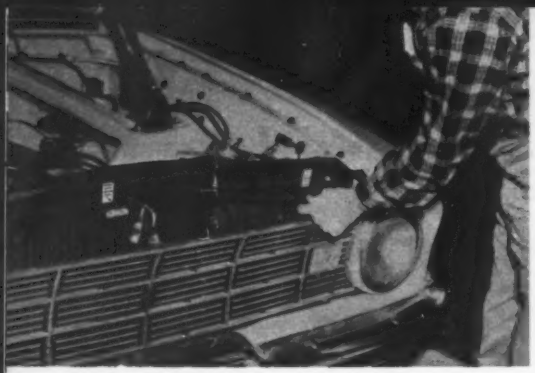


WITH A NEW oil filter, add one quart of engine oil to the normal 3½ quarts carried.

ADJUST BRAKES as soon as pedal travels over halfway to floorboard before engaging.



REMOVING screws from lamp door and retainer ring permits access to headlights.



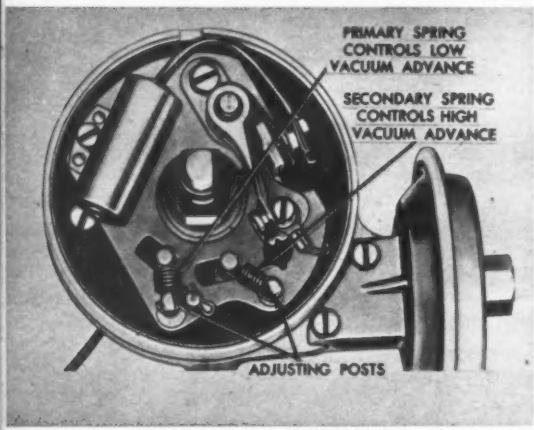
HOOD SUPPORT ROD is easy to reach, fits under bracket that keeps it from rattling.

BLOWER FAN—or vents, during open-ro driving—force air from heater into c

WATER-HEATED SPACER under carburetor checks cold-weather stalls during warm-up.

The rear axle housing holds two pin of oil. The standard rear axle ratios both Fordomatic and conventional dri jobs are 3.10 to 1, but a 3.56 to 1 option ratio is also available. The latter rat is recommended for city driving. But fo economy, smoother acceleration, an long-distance driving, the standard 3.1 ratio is to be preferred. One Falco owner with a Fordomatic model told m he gets 26 mph with a 3.10 axle—an that's in hilly country in midwinter!

You'll be interested to learn that th Falcon is a car with fenders that are easily replaced—an important money saving factor in event of a brush wit another car. Falcon employs a rattle-free hood rod that folds down under th hood latch and over a catch. The lid o the car's spacious luggage compartmen



THE BREAKER ARM in the distributor should have a tension between 17 and 20 ounces.

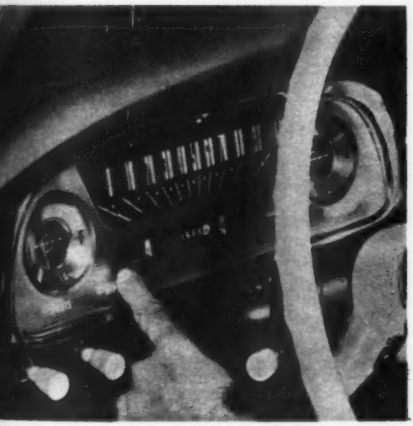
THE BREAKER POINT gap in the Falcon ca should be adjusted to .024 to .026 inches.

REACH the shock absorber retaining nuts through slots in luggage compartment floor.

is supported, when open, by a torsion bar. By the way, while the lid is up, note the two elongated slots in the front of the compartment which offer access to the rear shock absorber's upper retaining nuts.

Bear these two points in mind while working on your Falcon: avoid side-to-side wander by not overtightening the clip nuts of the car's leaf springs and by always remembering to check front-wheel alignment when any part of the front suspension has been removed or replaced. And keep a regular check on the tire pressure. The 6.00X13 four-ply standard equipment tires on Falcon should be inflated to 24 pounds.

Always use oil for "service MS" in your Falcon's engine: SAE 20 or 20W for tempera- [*Continued on page* 152]



IT'S NORMAL for oil pressure indicator light to glow momentarily on quick stops.

SERVICE TIPS

from Detroit

Buick suggests operation of their cars' air conditioners once a week during the winter. Running the unit for a few minutes helps lubricate compressor seals and bearings and prevents loss of freon gas coolant.

The tops of this year's Dodge convertible models can be lowered without unzipping the rear window because the zipper now extends across the top only and not around the sides as before.

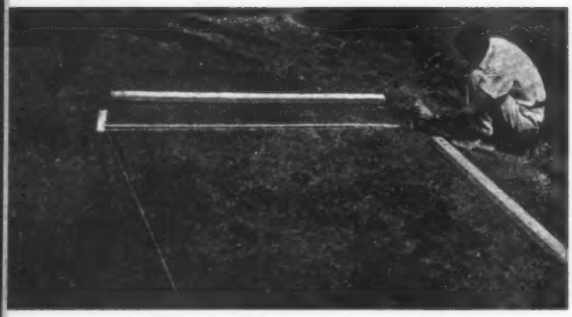
If you notice paint discoloration around the battery area (hood edge and right front fender) of your '59 Ford, it may be caused by excessive battery fumes due to high current or voltage. Check the generator regulator and, if necessary, readjust it.

If the directional signal lights improperly cancel when the steering wheel of your new Chrysler or Imperial is turned in the direction the signal is being given, the orange and violet lead wires are reversed at the cancelling switch on the steering column. Reconnect them.

A rattle in the dash panel assembly of the current Rambler Six, Rebel and Ambassador series, may be traced to a loose radio speaker plate assembly on cars not equipped with radio.

On '60 Plymouths the pitman arm for power steering units is 6½ inches from center-to-center of attaching holes; for manual steering units the distance is 5⅜ inches. Don't use a power steering unit on a car equipped with manual steering or the steering center link may contact the oil pan drain plug.

BUILD A SHUFFLEBOARD COURT



LAY OUT court with string stretched between stakes at each corner. Check height with level.

Here's a game that offers fun for the entire family.

By L. L. Squires

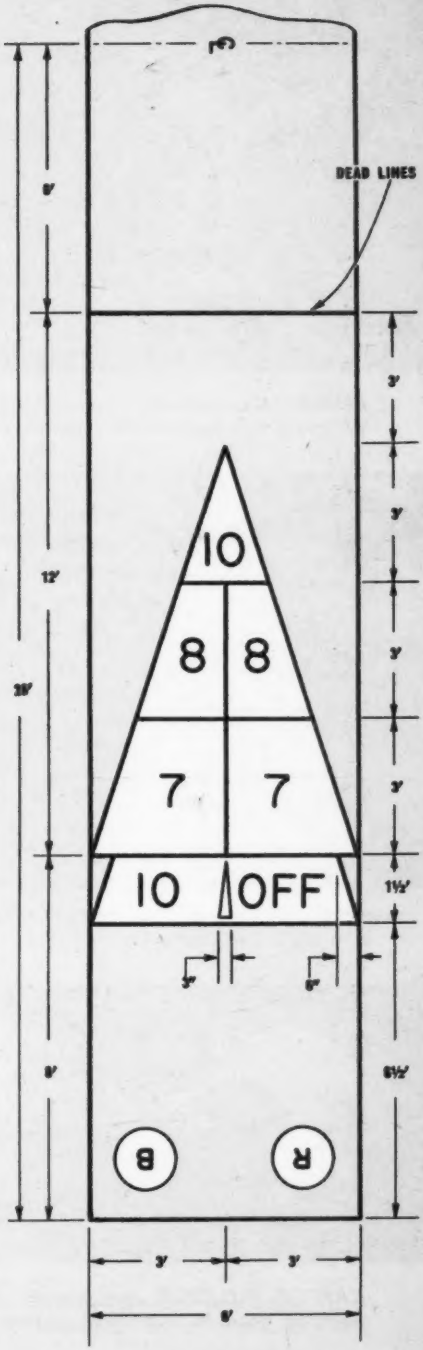
THOSE of you who have played shuffleboard know the relaxation and old-fashioned fun it provides. Newcomers to the game will find it a fascinating pastime in which the whole family can participate. So c'mon youngsters, oldsters and in-betweens, let's build a shuffleboard court!

SHALLOW TRENCH dug around the perimeter of the court area is for the 2x4 frames.

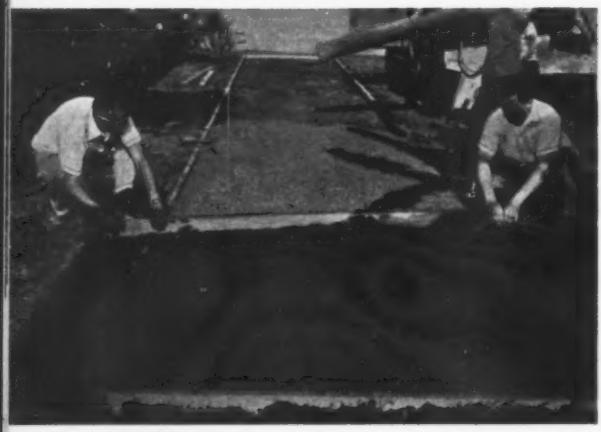
FRAMES are set in place as shown. Six-foot 2x4 checks width between side forms.

You don't have to make it strictly "regulation," since space limitations may dictate a less than standard-size court. Even a suitable driveway, patio or basement area can be marked off as a court: just paint on the outline and diagram of the game according—or proportionate to—the drawing at the right. But if you're starting from scratch, this is how it's done:

Stake out the court to the desired dimensions on a level area of ground. Add an extra four inches in length and width



CONCRETE is poured into framed court area, then shoveled and tamped into corners of the frames.



SURFACE of fresh concrete is leveled off using a length of 2x4 drawn across edges of side frames.

CAREFUL FLOATING and troweling are essential finishing steps in smoothing surface of the court.

to allow for the 2x4 forms and then dig a trench around the perimeter of the court area to a depth of three inches. The top of the court should be at least one inch above the ground.

With the forms in place, the next step is to order some ready-mixed concrete. You'll need about four cubic yards. Price, delivered, is around $1[illegible] per yard. The cement is now poured to a four-inch depth in your cinder-bedded excavation. Level the cement by dragging a length of 2x4 along the top edges of the side forms. This done, the cement is carefully floated and troweled until a smooth and level surface is achieved.

Next day cover it with clean sand and keep the cement dampened for six to ten days, allowing an additional five days for thorough drying.

Finally, remove the forms and paint on the diagram after laying it out with a straightedge and penciling to the *centers* of the lines. Use a good grade of exterior paint, preferably black for best contrast against the concrete. However, more colorful hues are also satisfactory. Yep, the court can be used as soon as the paint has dried. •

STENCILS, masking tape and a narrow paint roller aid marking.

New Garden Products

JARDINIERES of colored plastic range from 6- to 17½-in. diameter with brass or wrought iron stand, are priced from 90c up to $10.

Max Klein, Inc., 8915 Northend, Ferndale 20, Mich.

BIRD FEEDER made of polyethelene holds over 2 pounds of seed which is visible through the container; $1.98.

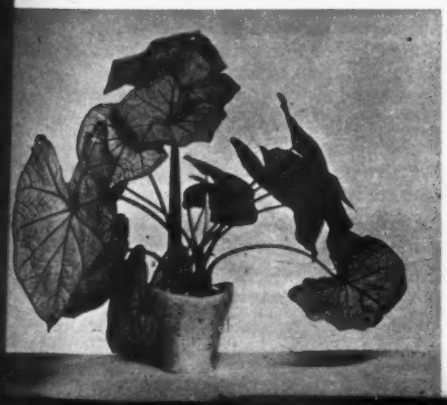
Plastray Corp., 1225 W. Maple Rd., Walled Lake, Mich.

SPRAYER attaches to hose end, blends weed killer or fertilizer with water. The jar is plastic.

Universal Metal Prod. Co., Saranac, Mich.

PLANT FOOD is a concentrated liquid. Half a teaspoonful makes a quart. Cost for 8 ounces is 69c.

Stim-U-Plant, Columbus 16, Ohio



PLANTER with treated soil, a bulb (Giant Amaryllis, Caladium or Riviera Paperwhite) and specific growing instructions is $1.49.

M. Van Waveren & Sons, Inc., Box 81, Little Falls, N. J.

[*Continued from page* 108]

appear anywhere on the surface. Both affect appearance and the lumber is graded accordingly.

Pitch Pockets are openings containing solid or liquid pitch. They have a minor effect on lumber strength but are difficult to cover with a finish unless they're first covered with a knot or pitch sealer.

SOFTWOODS in the better grades are suitable for both painting and natural finish and can be used for trim, flooring, some cabinet work and paneling. Lower grades are used for framing, sheathing, sub-flooring, shelving, etc. They take paint well but are frequently left unfinished.

FINISH LUMBER is graded on appearance and comes in thicknesses of less than three inches.

A & B Grades are clear with few defects and suitable for a natural finish.

C & D Grades may have defects and irregularities on both sides but take paint well.

DIMENSION LUMBER is graded basically on strength and straightness and comes in thicknesses from two inches to anything less than five inches in any width.

No. 1 is often called *construction* lumber. It may have minor defects which do not affect strength.

No. 2 is also called *standard* lumber. It may have more defects than the first grade with little or no affect on strength, depending upon its use.

No. 3 is known as *utility* lumber. It may have large knots and other irregularities but the strength is good and it is suitable for many building needs.

COMMON BOARDS are primarily graded on appearance and come in thicknesses of less than two inches and widths up to 12 inches or more.

A Select is clear on both sides and will take a natural finish.

B Select has few defects with one clear side which is suitable for a natural finish.

C Select has a few minor defects which are easily covered by paint.

D Select has many defects on both sides but paint will cover them adequately.

No. 1 Common is a sound wood with tight knots.

No. 2 Common has many knots and other irregularities.

HARDWOODS are primarily used for flooring, trim, cabinet making, furniture, etc. The better grades are suitable for a natural finish.

First is the top grade which is better than 90 per cent clear on both sides.

Second is approximately 85 per cent clear on both sides.

Selects are approximately 90 per cent clear on one side.

No. 1 Common is approximately 75 per cent clear on one side.

No. 2 Common is approximately 65 per cent clear on one side.

Sound-Wormy is approximately 70 per cent clear on one side with worm holes which don't affect strength but do add character.

No. 3A Common has irregularities on both sides.

No. 3B Common has many knots, defects and irregularities.

LUMBER CATEGORIES

Boards are less than two inches thick and one inch or more in width.

Joists are four inches thick and eight inches or more in width.

Planks are between two and five inches in thickness and eight inches or more in width.

Scantlings are between two and five inches in thickness and under eight inches in width.

Strips are less than two inches thick and under six inches in width.

Timbers have no dimension smaller than five inches.

Surfaced Lumber has been dressed with a mill planer. It may be surfaced on one side (S1S), on two sides (S2S), on one edge (S1E), on two edges (S2E) or a combination of sides and edges (S2S2E).

Shiplapped lumber has an edge dressed for a close rabbet or lapped joint.

Patterned lumber has been shaped or worked to a patterned or molded form.

Matched lumber has been edge-dressed and shaped for a close tongue-and-groove joint at the edges or ends.

Worked lumber has been run through a matching machine or molder. It may be matched, shiplapped or patterned.

WOOD GRAIN

When lumber is cut at right angles to the rays, or tangent to the growth rings, it is called *plain-sawn* or *flat-grained* lumber. When cut parallel to the rays, across the growth rings, it is called *quarter-sawn, quarter-cut* or *edge-grained.*

Plain-Sawn lumber is generally less expensive than quarter-sawn since there is less waste in the cutting process. In all softwoods and in many hardwoods, such as ash, elm and chestnut, this process produces excellent grain texture.

Quarter-Sawn lumber shrinks less in width than the plain-sawn type and is more resistant to warping, checking and twisting. In woods such as oak and mahogany, quarter-sawn lumber has a much better grain texture and is preferable for natural finishes.

Edge-Grain lumber, produced by the quarter-sawn method, is generally considered preferable to flat-cut lumber for finish work. However, the grain pattern of flat-cut lumber is most popular for paneling.

Straight-Grain lumber, or wood that has the fibers running parallel to the length of the boards, is usually much stronger and more durable than cross-grained stock.

WOOD SEASONING

If green or freshly-cut lumber is used for construction purposes, the warping and shrinking will cause nail popping, cracked plaster and structural weakness. Therefore, excess moisture must be removed beforehand, either by natural or artificial means. Both *air drying* and *kiln drying* produce comparable qualities, making the wood more workable and increasing its strength and stability, but kiln drying can be accomplished in a matter of hours and air drying requires many months.

According to the U. S. Forests Products Laboratory, a log 16 feet long and 15 inches in diameter might contain up to 70 gallons of water when first cut. Most of this moisture is removed in the drying process and the properly seasoned wood is much less susceptible to mildew and decay, has greater holding strength for fasteners, greater electrical resistance and better insulating qualities. While seasoned lumber costs slightly more than green stock, it is well worth the difference.

Warping and shrinking is associated with the direction of the growth rings in a board. Normal shrinkage is greater when the face of the piece is parallel to the rings than when it is across them. Edge-grain (quarter-sawn) lumber is subject to less over-all shrinkage since the greatest shrinkage is across the narrowest dimension of the board. Flat-cut boards, on the other hand, are more susceptible to shrinkage; they have a tendency to cup away from the heart side. These qualities are of particular importance in joinery work.

Some mills wax the ends of lumber as protection against warping. If this hasn't been done, the end grain can be coated with a thin film of shellac, varnish or oil paint. Salvaged lumber that is already painted should not be dressed before storage since freshly-dressed surfaces invite rapid moisture absorption.

Lumber should be stored out of direct sun rays in a dry, moderately warm place and stacked so that there is free air circulation. If it is coated with a sealer and kept under fairly constant humidity conditions, it can be stored for long periods without warping, swelling or shrinking. Large pieces, long-grained boards and plywoods should be stored flat whenever possible; otherwise, they should be stored on end. Thin veneers must be stored flat and also should be weighted down.

PLYWOOD

GRADING in plywood designates the quality of the face veneers and the inner plys of a panel. There are two basic types, interior and exterior, which are graded in four general categories.

Interior Plywood is for indoor application. While it is moisture-resistant, it is not waterproof.

Exterior Plywood is bonded with a phenolic resin adhesive which is entirely waterproof and even withstands boiling water indefinitely. Many boats constructed of exterior plywood have been afloat for years.

Grade A has no open face defects, is smooth and paintable and can be used with a natural finish.

Grade B may have tightly-sealed knots up to one inch in diameter. It is smooth and paintable and can be used with a natural finish.

Grade C may have knots up to one and a half inches in diameter and small borer holes. It is used for inner plys, sheathing, and back panels. This grade also takes paint well.

Grade D may have knots up to two and a half inches in diameter and pitch pockets up to 2x4 inches. This grade is strictly for hidden panels, sheathing and inner plys.

For economy and convenience, plywood panels are available in combinations of grades. All panels are stamped with the grade, prefaced with *INT* or *EXT* for complete identification. When an inside project calls for plywood, and only one face will be visible, maximum economy is obtained by ordering *INT-A-D* paneling. This means that it is designed for interior use with the face side of *A* grade and the reverse or hidden side of *D* quality.

Plywood is one of the most versatile building materials. It is available in numerous grains, textures and finishes, works easily with ordinary tools and has exceptional strength and durability.

ORDERING LUMBER

To avoid serious and costly error when ordering lumber for a project, you should be acquainted with the way it is dimensioned. The original dimensions of lumber are what determine the *nominal size* and the general practice is to order by the nominal size. However, when the lumber has been dressed, the dimensions are reduced to what is known as the *common size*. Thus, when you order surfaced lumber, say a 2x4, the actual size of the piece is 1⅝x3⅝ inches. By the same token, if you plan on 12-inch shelves, a 12-inch board is not available unless it is cut from a larger board. The finished size of a 12-inch board is 11½ inches. So, when planning a project, specify your dimensions according to the variations shown in the following chart:

NOMINAL SIZE	COMMON SIZE
1x2	25/32x1⅝
1x4	25/32x3⅝
1x6	25/32x5½
1x8	25/32x7½
1x10	25/32x9½
1x12	25/32x11½
2x4	1⅝x3⅝
2x6	1⅝x5½
2x8	1⅝x7½
2x10	1⅝x9½
2x12	1⅝x11½
3x6	2⅝x5½
3x8	2⅝x7½
3x10	2⅝x9½
3x12	2⅝x11½
4x4	3⅝x3⅝
4x6	3⅝x5½
4x8	3⅝x7½
4x10	3⅝x9½
6x6	5½x5½
6x8	5½x7½
6x10	5½x9½
6x12	5½x11½
8x8	7½x7½
10x10	9½x9½

THE BOARD FOOT is the standard unit of measurement by which lumber is priced and sold. A board foot is the equivalent of a piece of lumber one inch thick by 12 inches wide by 12 inches long. Board feet are easily computed by the simple formula: nominal thickness in inches multiplied by nominal width in feet multiplied by nominal length in feet equals board feet. The only exception to this formula is when the nominal thickness is less than one inch; then board feet are determined merely by multiplying the nominal width in feet by the nominal length in feet.

In addition to the board foot, lumber is also sold by the linear foot when special materials such as lattice and dowel are involved.

PROCEDURE in designating lumber is to first list the number of pieces in each size, then the thickness, the width and the length, followed by the name of the particular wood desired. For example: 2 pcs. 1x2x10 yellow pine.

How To Buy Lumber

Softwood is usually sold in multiples of two-foot lengths. Therefore, if your plans call for a nine-foot length of lumber, you'll have to order a ten-foot length and cut it to size.

Hardwood is generally sold in odd- and even-foot lengths. It is stocked in thicknesses from one-half to six inches, widths from three to 12 inches and lengths from two to 16 feet.

Shorts are found in most lumber yards. These are odd-size short pieces, equal in quality to standard-size boards. However, they're sold at discounted rates because of their size.

Plywood is generally sold in 4x8-foot panels of various thicknesses, though smaller and larger panels are available.

Shingles and Lath are usually sold by the bundle.

The following chart will aid in the selection of lumber:

Wood	Workability	Shrinking	Warping
ASH	Fair	High	Moderate
BASSWOOD	Excellent	High	Moderate
BEECH	Fair	High	High
CHERRY	Fair	Moderate	Low
CHESTNUT	Excellent	Moderate	Low
COTTONWOOD	Fair	High	High
CYPRESS	Fair	Moderate	Moderate
DOUGLAS FIR	Fair	Moderate	Moderate
ELM	Fair	High	Moderate
HICKORY	Fair	High	Moderate
MAHOGANY	Good	Moderate	Low
MAPLE	Fair	Moderate	Moderate
OAK	Fair	High	Moderate
PINE (Ponderosa)	Excellent	Moderate	Low
RED CEDAR	Excellent	Low	Low
RED GUM	Good	High	High
REDWOOD	Good	Low	Low
YELLOW PINE	Fair	Moderate	High
SYCAMORE	Fair	High	High
WALNUT	Good	Moderate	Low
WHITE CEDAR	Excellent	Low	Low
WHITE FIR	Good	Moderate	Moderate
WHITE PINE	Excellent	Moderate	Low
YELLOW BIRCH	Fair	High	Moderate
YELLOW POPLAR	Excellent	Moderate	Low

Pick a reliable dealer and seek his advice when in doubt as to the type, quantity or quality of material needed. Inform him how and where you intend to use the lumber and he will give you the benefit of his many years' experience.

ECONOMY TIPS

If you can conveniently handle lumber two or more times longer than the length needed and can probably use the extra lengths later, it is more economical to purchase the longer lengths and cut them yourself.

Most yards allow and encourage customers to select their own material. In this manner you frequently can find stock that has been graded down because of defects on one side only but will still serve the purpose. In other cases you'll find common grades in which the defects can be adequately hidden by paint.

Where you plan to take advantage of natural wood characteristics, such as in knotty pine, you can generally save money by careful selection of lower grades. Then loose knots can be sealed and pitted areas can be filled.

Many dealers display sorted and prepackaged small stock for special uses. Composed of end pieces, mill rejects, etc., this material is still good and frequently offers great savings.

If your plans call for a large quantity of wood, it might pay to investigate prices where an old building is being torn down. Such lumber is often quite sound and can be bought for a fraction of the cost of new material. You'll probably have to supply transportation for the lumber but a rented or borrowed truck can solve this problem.

Before using salvaged lumber, check it for soundness by inserting a knife blade into the surface. If the blade penetrates the fibers easily, further investigation is needed for termites and rot. If the wood is sound, it should still be checked with a magnet for hidden nails or screws before running it through any power tool. With trimming and sanding, the old wood can be given the appearance of new stock.

After you've purchased the proper wood for your project, the only thing remaining is to guard against human error. The greatest loss in woodworking is caused by inaccurate measurement. An old adage states, "Measure twice before cutting once." Once a piece is too short or too narrow, there is very little that can be done—but precise measurement in the beginning will prevent the waste. •

[*Continued from page* 143]

CHECK air cleaner every 5,000 miles under normal driving; sooner in dusty atmospheres.

LUBRICATING the hood hinge periodically will help keep it free of rust and squeaks.

tures between 20° and 90°F; SAE 30 for temperatures above 90°F; 10W for temperatures between —10° and 20°F; and 5W for temperatures below —10°F. The factory says that multiviscosity oils (5W-20, 10W-30, etc.) may be used if they meet the minimum requirements for API oil classification for "service MS." Type-A automatic transmission fluid or Ford automatic transmission fluid should be used in Fordomatic. Keep the steering gear case filled with SAE 80 oil.

Many mechanics will not agree with Ford that engine oil should be changed at 4,000-mile intervals but will prefer to change it as often as every 1,000 miles if the car is confined to excessively short runs in cold weather when crankcase dilution is a problem. But the 4,000 mile oil filter replacement rule can be followed.

An interesting thing about the 90-hp Falcon engine is the water-heated spacer at the base of the carburetor that prevents the carburetor throttle plate from icing in cold weather. Remember to check this point if there occurs a mysterious loss of coolant. The Holley carburetor itself has a transparent float bowl that shows the fuel level at all times; with the float's needle valve living in this veritable goldfish bowl, its misbehavior is easily noted. The fuel filter consists of a wire screen in a glass bowl. The air cleaner is the replaceable paper type.

Self-locking screws are used to secure adjustments made on the valve tappets. The cylinder head is a simplified one-piece casting with a built-in intake manifold. The cock for draining the block of coolant is located at the right side of the block just in front of the starter, with another drain, of course, at the bottom of the radiator.

Anyway you look at it this Ford compact is definitely one of the 1960 offerings that is putting the fun back into driving *and servicing* a car. •

BUILD THIS

PADDLE WHEEL BOAT

Less than $35 and a weekend's work go into this 7¾-ft. fun boat. For your large-scale plans, send $2 to MI Plans Service, Fawcett Bldg., Greenwich, Conn. Specify Plan B-241, Paddle Wheel Boat.

Speed Weeks '60

[*Continued from page* 89]

Rubber, drove the pace car with me alongside to start the final race—and here's a kid who's a hotrod from way back. I had a helluva job slowing him down so that the 70 Grand National cars could catch up and get in starting formation. It took three laps before we had them right. If I hadn't shouted to DeYoung, "Pull off and let 'em go!" I think he'd have tried to finish the race. The way he was going he'd have probably placed in the money.

The big deal in Speed Weeks for me, with MI readers in mind, is the beach trials which are under my supervision. Here the cars must run with all showroom specifications and with all equipment aboard and in working condition at the start and at the finish. This start and finish rule caused the disqualification of the fastest Plymouth, which threw a fan belt, and also the fastest Chevy which did the same thing. The Plymouth of famed sports car driver Paul O'Shea averaged 138.2 and Harry Perry's Chevy Impala averaged 136.2. These were both tops in their classes, but the old fan belt rule got them. In the Unlimited Class, Gregg Ziegler set a new record with his Chrysler 300F at an average speed of 144.9 mph. The ability of these Chryslers is described in the 300F test report in this issue.

The MECHANIX ILLUSTRATED Standing Start Mile brought out a large field and the overall trophy was grabbed by Bob Pemberton in a Pontiac, for the second year. In the compact division of the Standing Start Mile, Marvin Panch won in a 1960 Valiant at an average speed of 80.6 mph. Panch also won the Flying Mile for compact cars with the same Valiant at an average speed of 117.1. Both of Panch's runs were new class records.

During the record runs the beach was in excellent shape but quite narrow due to unfavorable wind and ocean currents. The running time (which is always at low tide) was cut considerably by sloughs that developed at either end of the trap an hour or more before normal. Unfortunately, in the interest of safety, most of the Century Club runs had to be called off each day as even the tail-enders in the record classes had to drive through a big, heavy film of water. However, all the cars entered in the Record Runs did get a chance to show just what they could do.

While this multi-ring circus was going on, there were midget races nightly at the Daytona Municipal Stadium, drag races at a nearby airport and Kart Championships each night on the new Jai Alai Fronton's parking lot. My own kart raced three nights but I never saw it go, due to the fact that I had to be in other places. However, reports from driver George Woodall and Pit Manager Charlie Gilman were that my Norseman Thunderbolt was as fast as any around but had the wrong tires for the freshly-laid asphalt and so lost out in the turns.

Speed Weeks have changed a great deal in the ten years I've been covering them. Once a carnival of yoks and fun, drunks and dames, it became more serious when all the factories were here vying for recognition with team entries. Now it's gone a step further with the completion of the new $3,500,000 track. The factories are supposedly out of racing due to an Automobile Manufacturers Association ruling. This ruling has been violated by many major manufacturers who are still in the racing business but in an indirect way.

Some factory teams reached Daytona under the "sponsorship" of favored dealers who often were unaware of their own entries! One interesting case took place this winter when a race official called a certain dealer in the south and told him, "You're late with your two entries; we haven't received them yet." The dealer, in complete surprise, answered, "What the hell, are you crazy or something? I have nothing to do with races and don't want to." He abruptly hung up. Within a few hours the same dealer phoned back to racing headquarters, saying, "I forgot I was entering a couple of cars this year. What do you want me to do?" The factory had evidently failed to notify this boy in advance that he was in the racing business this year.

Other entries were made through car manufacturers' suppliers who were only too glad to return a favor for their mammoth customers. There were actually

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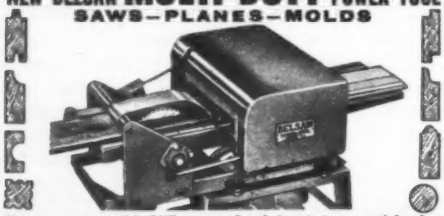

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BELSAW POWER TOOLS, 930 Field Bldg., Kansas City 11, Missouri

Speed Weeks '60

[*Continued from page* 153]

hundreds of factory men in the pits at Daytona this year, including top engineers. By the same token, another well-known Big Three camp yanked all its top men away from the area overnight, for reasons still unknown except to the company president.

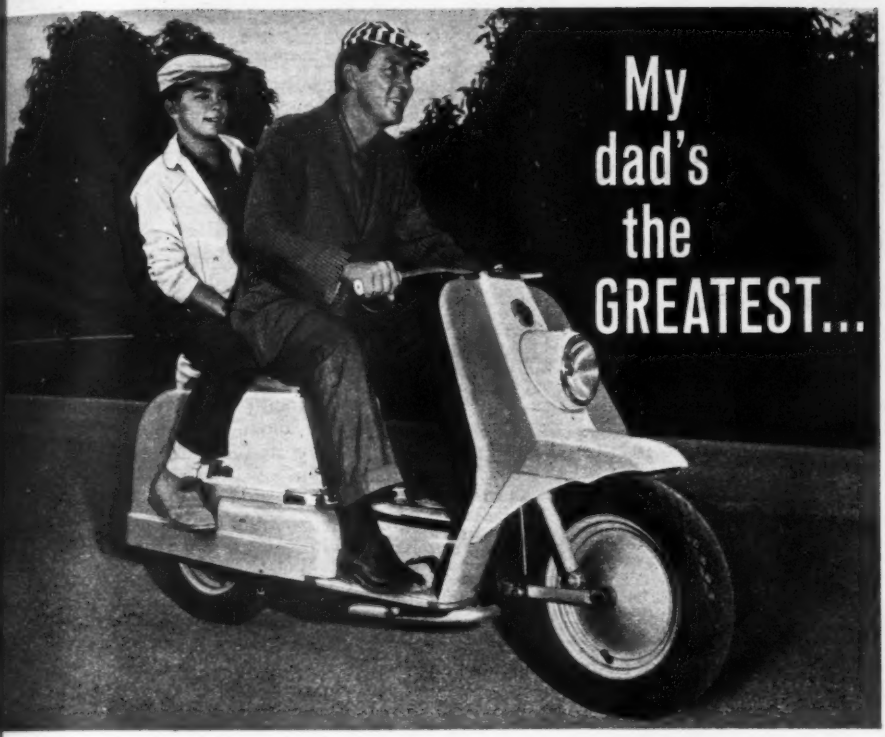
One company that has come up fast in racing during the last two years is Goodyear. Under the astute handling of Dave Evans, they invaded Firestone's almost exclusive territory to the point where eight of the first ten cars in the 500-mile race, including the winner, were mounted on Goodyear racing rubber. Three years ago it would have been a safe bet that all of the first ten would have been on Firestones. This is a healthy situation all around for consumers as the better these boys build racing doughnuts, the more you're going to get for your money when you buy tires for your go-to-work car.

One really comical thing happened this year. Autolite heavily invaded the race field for the first time with their spark plugs. They built a new building at the track and all the company brass was on hand, giving out whatever aid the race drivers wanted. In direct opposition to them in this spot were the Champion boys. Here's where the big laugh comes in. Both Autolite and Champion pay off for cars winning with their spark plugs. In the big 70-car-field Modified race every car was equipped with either Champions or Autolites except one which was using Lodge plugs. You guessed it—the car with the Lodge plugs won! In all fairness I should point out this was the only event won during Speed Weeks by Lodge plugs. Autolite is as important competition for the formerly undisputed Champion as Goodyear is for Firestone.

Speed Weeks have changed but it's still a great big show put on in a great big way. Many miss some of the old-time fun, open house saloons, uninhibited company executives and the thousands of accompanying hangovers. Sure, there were dozens of company parties this year that cost thou-

[*Continued on page* 156]

When answering advertisements please mention MECHANIX ILLUSTRATED



and so is my new HARLEY-DAVIDSON TOPPER

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What a ride — gentle as a billowy summer cloud . . . with dual suspension and large foam rubber saddle. Dependability — plenty of get-up-and-go. Automatic *Scoot-away* transmission—no shifting or clutching needed.

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Speed Weeks '60

[*Continued from page* 154]

sands and thousands of dollars but the general tone was more sedate. There was a new dignity that has come with the success of Speed Weeks that not only attracted two network TV shows but international radio coverage as well. That anything-for-a-laugh atmosphere has really gone out with the tide of other Speed Weeks. Too bad. •

Tests The Chrysler 300F

[*Continued from page* 92]

and more docile in heavy city traffic than its slightly more race-like version. Let's face it—try naming the times when 130 mph wouldn't be fast enough for you.

The steering is quick and as accurate as a Sharps rifle and, with power steering, feather-light. The big differences in the two engines available are solid lifters against hydraulic lifters, bigger carburetors and a competition-type cam. Both engines have the new ram manifolding which really makes itself felt at speeds above 70 mph. On many occasions during Speed Week (when I was testing out the track on the beach for possible danger spots before letting any contestants run) I'd suddenly belt it all the way while cruising at 75-80 mph and the car would actually wheelspin and then whip forward like a missile—90, 100, 125 mph in a matter of just a few hundred feet!

In the Standing Start MECHANIX ILLUSTRATED Mile, the 300F took second place behind one extremely hot Pontiac that won the MI Trophy. Brewster Shaw drove the first of the 300s in the acceleration trials. He broke his old record by better than one mile an hour but the single Pontiac smashed it by better than five mph. The winning Pontiac, owned by the Air Lift Corp., was extremely well prepared, similar to a Grand National car but within the rules governing the Speed Trials. The particular Pontiac's preparedness was proven by the fact that there were many Pontiacs in the contest but the second fastest Pontiac finished in tenth place overall.

This seemed odd at the time, so I made a number of inquiries and found out that most of the Chryslers had fallen victim to

some poor advice given by a supposed "expert" from Detroit. This guy, who has goofed on the beach in other years, advised the 300F drivers to run with only 15 pounds of air in the rear tires and 50 pounds or better in front. The advice was undoubtedly based on experience on short dragstrips where this low pressure gives much more rear-wheel traction.

Where the "expert's" well-meaning advice came apart was that this was an extremely long drag, one full mile, and much greater speeds were attained than could ever be reached on a short course. At these high speeds, the soft rear-tire pressures which helped in the getaway almost became killers when the imbalance caused the rear wheels to try and swap places with the front. All the top 300s were doing 140 mph before reaching the end of the mile and the low-pressure rear-tire jobs, now under full horsepower, were almost completely out of control. One 300 missed the end of the trap entirely and almost hit the ocean! Another crossed the finish line in a semi-broadslide. Two other Chrysler 300F drivers told me that the handling got so bad after they passed about 135 mph that they had had to back off speed. So much for Michigan advice . . .

A reasonable question at this point is, "If the Chrysler 300F is so hot, why don't we see them take the stock car races such as the big Daytona 500 which was won by a Chevrolet?" With this question in mind, my entire reporting staff of two descended on the pits before the big race and fired it at just about all the top drivers. The answer was practically unanimous, with a few slight variations—*"Cost."*

The 300 is an expensive car. The average stock car racer can buy two Plymouths, two Fords or two Chevys, stripped, with the big engines, for roughly the same price as one 300. Now, after every big race these cars are torn down and completely rebuilt and a great many of the parts are replaced. Parts for the limited-production 300 cost more than they do for a cheap car. So anyway you look at it, the investment for a 300 runs higher than the average stock car driver wants to go.

Also, as one of the top drivers pointed out, if you should get in a tangle and wreck a 300, you've lost a lot of dough—and you

[*Continued on next page*]

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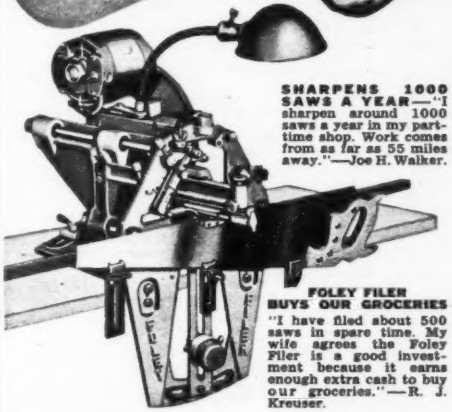
FILING SAWS



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"I have filed about 500 saws in spare time. My wife agrees the Foley Filer is a good investment because it earns enough extra cash to buy our groceries."—R. J. Kreuser.

FOLEY FILED SAWS BRING NEW CUSTOMERS

Here is a steady repeat CASH business that pays from $3 to $6 an hour, and you can start in your own basement or garage in your spare time. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings more customers. J. C. Deibert wrote us: "Since I got my Foley Filer five years ago, I have averaged 4¼ saws each day over all this time." Howard Kuhns says: "We operate 2 Foley Filers, and our business averages about 500 saws per month. The count last year was 5,798 saws."

The new model 200 Foley Saw Filer (shown above) is the **first** and **only** machine that automatically sharpens combination (rip and crosscut) circular saws—also all hand saws, band saws and crosscut circular saws. The adjustments are simple—there is no eyestrain—and you can start right away to turn out perfect cutting saws. Exclusive jointing action evens up irregular teeth—old saws cut like new!

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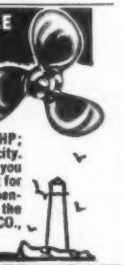

Send card for OUTBOARDER'S BIBLE — our 1960 catalog. It's FREE. Contains much valuable information on how to get MORE SPEED, or more THRUST for WATER SKIING from motors of 7½ to 80 HP; better performance and load carrying capacity. Easily understood recommendations enable you to choose a propeller virtually custom-built for your motor-boat-load combination — inexpensive, more rugged and damage-proof than the original. Send card, MICHIGAN WHEEL CO., Grand Rapids 2, Mich., Dept. M1

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could do this on the first lap. A tire failu a fuel pump breakdown, or even fa plugs will sink a 300's chances just as as a car costing half the price. Add to the fact that after you've raced it at a track such as the Daytona Internatio Speedway or the track at Darlington, n of the other tracks in the country are sh (by comparison) and sometimes dirt. 90 per cent of all stock car races are h on short tracks (a course that is decide a disadvantage to the big, heavy 300), soon realize why the car has very li appeal to the small-budget operator. many short courses it would be surpris if a highly-tuned Valiant couldn't tak 300, for some very simple reasons: its sh length would allow it to maneuver th back-yard ovals more freely, and th would be much less tire wear and str due to the Valiant's lighter weight.

On most of the country's tracks, n high speed is rarely an advantage as cars seldom go much faster than 80 m When Carl Kiekhaefer was dominating stock car racing with his teams of 300 few years ago, they were unbeatable— Carl, the builder of Mercury outbo motors, had a bankroll that could stand gaff. As one top driver said to me when was making my inquiries, "If Kiekhae was back in stock cars I'd sure like to running a 300 for him—you couldn't m But with my bank account I'd be fin cially dead with the first wreck."

In summing up, the 300F is the hott sedan ever built in the history of the wo —and that takes in all countries includi Iceland. When *I* get a thrill out of a c it's got to be pretty hot. After testing th job, I switched the order I had put in f a 1960 Imperial to a 300F.

The one drawback this car had for m was the fact that due to the elabor manifolding, Chrysler's Auto Pilot ca be fitted in. However, though I haven't y received the car at this writing, I just o dered a Magi-Cruise outfit similar to t one Pontiac features. It will give me m of the advantages of the Auto-Pilot f less than $15 and will pay that back in g savings in the first few long trips I ta Pontiac's Magi-Cruise holds the throt in any position you want it by simply t ping the brake pedal. To call the wh thing off you just tip the brake pedal ag

—a feature I'd no longer do without on a coast-to-coast trip. The 300F won't give me the family-type comfort the Imperial did. But recently I found that my swashbuckle had acquired a few tarnish marks. Maybe the 300F will help wipe them off. •

Languages To Order

[*Continued from page* 63]

an offer in code, and Mitchel delivered the message.

The Philadelphian looked at the code words and shook his head. "I'd like to do business," he said finally, "if you could find out what he's saying. I don't understand Belgian. Can you ask him to cable in English?"

Mitchel, like all authorities in secret writing, draws a sharp line between codes and ciphers. With a cipher, you just substitute one letter of the alphabet for another. For example, say that A equals H, B equals A, and H equals T. You send ABH and the receiver translates it into HAT. Once you start substituting letters, you can change the cipher as easily as a baseball team changes its signals. The advantage of ciphers is that you can memorize the key and work out the real meaning with a pencil and paper. You don't need a code book. But any cipher

[*Continued on next page*]

BERLIN radio message "A son is born" warned German officials to prepare for World War I.

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BALL BEARING SPINDLE
PRECISION GROUND CAST IRON TABLE

Ideal for light factory work — excellent for the home workshop — that's the new Model 5908 8" TILT ARBOR SAW. Over 300,000 sold already! Does everything same as saws costing 4 times as much — cross cuts, rips, bevels, mitres, dadoes, cuts compound angles. Adjustable depth of cut: 0" to 2¼". Blade tilts to 45°. Heavy duty all cast iron and steel construction. Precision ground cast iron table. Sealed NEW DEPARTURE ball bearings never need lubrication. Price includes massive cast iron mitre gauge and patented motor drive that fits any motor. All parts and labor guaranteed 10 years.

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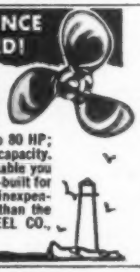

Send card for OUTBOARDER'S BIBLE — our 1960 catalog. It's FREE. Contains much valuable information on how to get MORE SPEED, or more THRUST for WATER SKIING from motors of 7½ to 80 HP; better performance and load carrying capacity. Easily understood recommendations enable you to choose a propeller virtually custom-built for your motor-boat-load combination — inexpensive, more rugged and damage-proof than the original. Send card. MICHIGAN WHEEL CO., Grand Rapids 2, Mich., Dept. MI

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"Perma-D" DIVISION • Central Machine Works Co.
1237 Central Avenue • Minneapolis 13, Minnesota

could do this on the first lap. A tire failu a fuel pump breakdown, or even fau plugs will sink a 300's chances just as f as a car costing half the price. Add to t the fact that after you've raced it at a b track such as the Daytona Internatio Speedway or the track at Darlington, mo of the other tracks in the country are sho (by comparison) and sometimes dirt. 90 per cent of all stock car races are he on short tracks (a course that is decided a disadvantage to the big, heavy 300), y soon realize why the car has very lit appeal to the small-budget operator. many short courses it would be surprisi if a highly-tuned Valiant couldn't take 300, for some very simple reasons: its sho length would allow it to maneuver the back-yard ovals more freely, and the would be much less tire wear and stra due to the Valiant's lighter weight.

On most of the country's tracks, re high speed is rarely an advantage as t cars seldom go much faster than 80 mp When Carl Kiekhaefer was dominating stock car racing with his teams of 300s few years ago, they were unbeatable—b Carl, the builder of Mercury outboa motors, had a bankroll that could stand t gaff. As one top driver said to me when was making my inquiries, "If Kiekhaef was back in stock cars I'd sure like to b running a 300 for him—you couldn't mi But with my bank account I'd be fina cially dead with the first wreck."

In summing up, the 300F is the hottes sedan ever built in the history of the wor —and that takes in all countries includi Iceland. When *I* get a thrill out of a c it's got to be pretty hot. After testing th job, I switched the order I had put in f a 1960 Imperial to a 300F.

The one drawback this car had for m was the fact that due to the elabora manifolding, Chrysler's Auto Pilot ca be fitted in. However, though I haven't y received the car at this writing, I just o dered a Magi-Cruise outfit similar to th one Pontiac features. It will give me m of the advantages of the Auto-Pilot f less than $15 and will pay that back in g savings in the first few long trips I tak Pontiac's Magi-Cruise holds the throtti in any position you want it by simply ti ping the brake pedal. To call the whol thing off you just tip the brake pedal ag

—a feature I'd no longer do without on a coast-to-coast trip. The 300F won't give me the family-type comfort the Imperial did. But recently I found that my swashbuckle had acquired a few tarnish marks. Maybe the 300F will help wipe them off. •

Languages To Order

[*Continued from page* 63]

an offer in code, and Mitchel delivered the message.

The Philadelphian looked at the code words and shook his head. "I'd like to do business," he said finally, "if you could find out what he's saying. I don't understand Belgian. Can you ask him to cable in English?"

Mitchel, like all authorities in secret writing, draws a sharp line between codes and ciphers. With a cipher, you just substitute one letter of the alphabet for another. For example, say that A equals H, B equals A, and H equals T. You send ABH and the receiver translates it into HAT. Once you start substituting letters, you can change the cipher as easily as a baseball team changes its signals. The advantage of ciphers is that you can memorize the key and work out the real meaning with a pencil and paper. You don't need a code book. But any cipher

[*Continued on next page*]

BERLIN radio message "A son is born" warned German officials to prepare for World War I.

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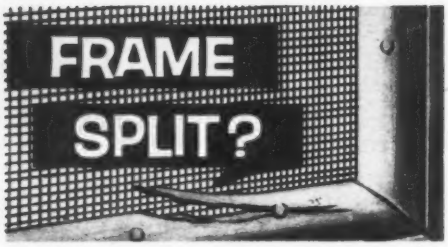

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Penn Yan Boats

can be broken if you work on it long enough.

Long before Pearl Harbor, a group of code-breakers in Washington managed to solve the Japanese top-secret cipher system. Unfortunately, it did not prevent Pearl Harbor but it gave us a preview of almost every other major enemy movement throughout the war.

For the next three years, practically every time the Japanese tried to make a big move, American forces were waiting for them.

On the other hand, codes can't be broken. The only way you can decode a message is by getting a copy of the code book. That's why all Navy code books are weighted with lead. If a ship is endangered, captains have orders to dump code books overboard.

The Germans also put codes to good use before World War I. One of the most famous code sentences ever broadcast came from the Berlin radio in August 1914 to German officers and diplomats around the world. The sentence was: "A son is born." That announcement, when decoded, was a grim notice to Germans everywhere to prepare for World War I.

Nobody knows exactly when commercial codes began. After the first cable to Europe was laid in 1866, Secretary of State Seward messaged that he intended to oust Maximilian as Emperor of Mexico. The coded message was the equivalent of 1,100 five-letter words but the British cable company billed Seward for $23,000. The British directors said they charged double for messages they couldn't understand!

Seward protested and won. Thereafter code messages were accepted without question. In 1934, the International Telegraphic Union agreed to accept any combination of five letters as one word.

In compiling catalogues of five-letter words, practically all code specialists make every one different by at least two letters. With this system, "any error in transmission practically detects itself," Mitchell says.

A few years ago an American exporter offered to sell goods to a Japanese merchant at LETNA EPNSD, meaning $36. One letter was transposed in the sending to read LETAN EPNSD, or $36. The Japanese jumped at the offer and the

American exporter lost thousands of dollars.

"With my system," says Mitchel, "there would have been no definition for the code word delivered. The person receiving the message would have known instantly that it was garbled."

Secret code messages for businessmen are now more important than ever, according to Mitchel. He says, "American industries abroad are as important as our diplomats. Almost everywhere, agents comb our cables and letters to learn everything possible about our atomic energy, oil, metal and uranium resources and airplane and automobile developments."

An incident that occurred in China some 20 years ago is a perfect illustration of the cloak-and-dagger-like operations that take place between international businessmen. A U. S. airplane representative there used a public code to cable his company a big order from the Chinese government. Within an hour, a frantic Chinese official phoned. "Already your message is all over the world," he said. "Next time use a private code."

Mitchel, a native San Franciscan, first learned about codes in the import and export business in 1917. "In those days," he recalls, "there were word combinations for expressions like 'Dammit, why don't you obey orders' and 'Tell the captain to go to hell.'" In 1923, a few backers helped him set up the Acme Code Company with offices in New York, San Francisco and London.

Mitchel boasts that he seldom takes more than a few hours to decode a message. But one woman stumped him with a message from her husband. It read, "Sehsiwtseb Sessikevol."

"If I had just looked at it carefully," he says, "I could have broken it immediately."

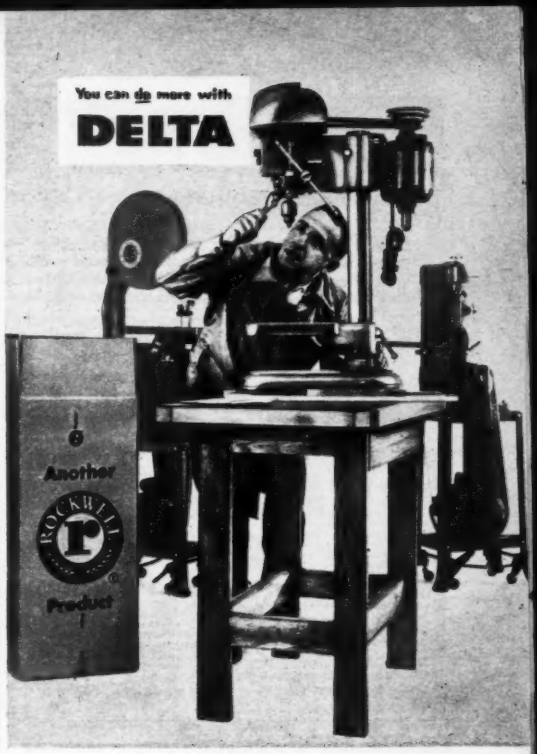
The message is in the simplest of all codes. Can *you* figure it out? •

Follow The Leaders

[*Continued from page* 64]

would want, are sold under the name of Estriada.

The seconds of each grade of leader material (the strands are not quite as good as the perfect ones of each grade) are set aside to be polished down until the defects



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you to tie tapers of greater difference in diameter, with security. 6. Nylon leaders are easier for the beginner to tie. 7. Nylon is more elastic than the best gut. This gives a dry fly a more lifelike appearance on the water. 8. Nylon leader material costs a fraction of the best gut. 9. Nylon is much stronger per diameter than natural gut.

There are, unfortunately, different grades of nylon leader material. However, you'll find that the leader material put out by each house is uniform in quality, something impossible to find in gut.

There is one thing to watch, however. Your leader will not be as strong as the material with which you tie it, whether you use gut or a synthetic. The weakness lies in the knots you tie. There isn't room here to go into knot tying, but you should investigate it thoroughly.

Why not, you then ask, buy the ready-made synthetic leaders, the ones tied without knots? This is a simple and easy solution if they are tapered to suit your needs. I have found them too light.

If you want dependable leaders to fish with this spring, read carefully the wording on the labels of any ready-tied leaders you inspect as well as on the material for tying your own. What's more, buy yourself a good micrometer and measure each strand you tie into your leaders yourself. If you do these things, your fishing should improve 100 per cent. •

To Use A Rental Trailer

[*Continued from page* 73]

to the station nearest your destination—be it Dallas, Seattle, Bangor or Minneapolis. The Nationwide system for instance, has over 1,500 hundred rental agencies where you can turn the trailer in.

The rental rates are roughly figured on a basis of one day to load, another to unload and 300 miles a day underway. For example, you're allowed nine days to make a trip from Philadelphia to Kansas City (cost: for a 4x8 closed van, $46.50). This is longer than you'd need but if you really dawdle there's an overtime charge of $3.00 a day. You pay in advance but no deposits are required when you deal with the big concerns.

Let's say you have decided to rent a trailer; here are a few tips that are worth

keeping in mind. First, watch the man carefully when he is attaching the hitch and trailer to your car, so you'll know what it should look like. Watch him as he connects the trailer's signal light wires to your car's electrical system.

Loading: For a smooth ride, about 60 per cent of the load weight should be forward of the trailer's axle. Trailers will whip or sway at certain speeds if loaded heavily in back or "balanced." Put refrigerators, washing machines and the like up front. Put your other heavier things (books, records, etc.) on the floor and the lighter things on top of them. Fragile items should be carefully packed in sturdy boxes or barrels. Use your blankets, rugs and quilts between pieces that might be scratched or marred, and tie everything down inside the trailer as you go. All trailers have cleats inside for this purpose. The important thing is to pack it tightly so there won't be any jostling or shifting of the load underway. Balance the load from side to side. Now you're all loaded and ready to roll.

Start slowly. If you have a stick shift, go through all the gears, trying to shift without any snaps or jerks. Once you get rolling, keep to the right wherever possible and use your side mirror often. When passing slower vehicles be sure to allow plenty of room for your trailer to swing back into lane. You need twice the braking distance to stop—so ration your braking. Come down steep hills in second gear or low range, depending on transmission, and let the engine do some of the braking. Don't change course without signaling your intention either by hand or by flashing your brake lights (most trailers have turn signals that tie in with your car's directional lights). Backing up is the sportiest maneuver of all. It takes a bit of practice to get used to the idea that when you turn the car's steering wheel one way the trailer goes another—sometimes. The best place to get the knack of this is in an empty parking lot.

Forty-five miles an hour seems to be a good speed for a car pulling a loaded trailer; in many cases it's the legal limit, too. The trailer companies recommend a speed one-third less than the posted limits. They also say you should be careful about

[*Continued on next page*]

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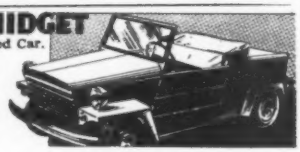

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flipping cigarettes out your car's windo because they can drift back onto trail

After you're rolling along, it's a go thought to stop every hour or so, get and inspect the whole set-up. Check tail light connections. Have your co-p step on the brake pedal of the car and if they light on the trailer. Check coupling mechanism, hitch and safe chain. Feel the hubs of the trailer to m sure they're not running hot. Check wheel lug bolts on the trailer for tightn and the tires for leakage. If it's rain and you have a soft-top trailer, inspect tarp and make sure there is no leak that it's tied down securely and not fl ping. Inverted chair legs and the like knife through a heavy tarp in short ord so they should be well padded.

Most of the big trailer rental compani offer a free safety inspection of your and load at any of their stations along yo route. Just pull in and they'll check for you.

Although it may sound like a hellu lot to keep in mind, it's actually pre easy. Renting a trailer is by far cheapest way to transport your househo goods. Once you see how easy it is you be thinking up lots of new uses for economy transportation. •

Trailers—Buy Or Build

[*Continued from page* 76]

pacity by weight ranges up to 1,0 pounds, although some heavy-duty u go as high as a ton and a half. The type y should buy is determined by what y want to haul. If the load is likely to be kind of duffel needed for a hunting or fis ing trip, the lightest trailer would do, though the bed should be roomy. On other hand, if you have in mind carti home raw materials for a flagstone pa or taking old locomotive wheels to junkyard, something more substantial called for.

Farmers, home contractors such painters and paper-hangers, salesmen a small businessmen find utility trail especially useful. This "extra axle" fre them from loading up a car or stati wagon with bulky and sometimes smel cargo, and the cost of operation is a fra tion of that for a small truck. Virtually

states require license tags, although the fee usually is low.

As a vehicle of pleasure, the trailer is admirably suited to the needs of fishermen who go in for heavy camping, bird hunters with dogs in tow, vacationers who need a lot of gear in the field or perhaps even picnickers with big families and appetites to match. Small pieces of furniture and extra-big Christmas packages can be carted from here to there free of charge by the trailer owner.

Utility trailers can be purchased as assembled units, in kit form or by components such as an axle or set of wheels. The man who builds his own frame and bed can save some money but not too much because the most expensive parts—the wheels and axle—necessarily are commercially made.

Owners of boat trailers sometimes are able to convert these units into utility haulers in the off-season by mounting a box on the chassis. The box often must be custom-made to fit a certain type of trailer, although at least one manufacturer, Carry-Craft of Matawan, N. J., produces such a unit commercially. The price is $79.95.

With the variety of trailers on the market today it will be easy to find exactly what you need and at the price you want to pay. •

Angles By Squangle

[*Continued from page* 84]

measuring rule and power handsaw guide. And it's small enough to carry in an overalls loop, like a hammer. The Squangle will do almost everything a 24-inch framing square will do, claims Ove.

Ove's first crude Squangle was cut and filed by hand more than three years ago. At first it resembled a T-square, with only a single crosspiece attached to the head of a foot-long square. He soon found that both sides of an established angle are used, so he added a second crosspiece. The next addition was a small level bubble in the head. Ove handmade six Squangles and used each one for several weeks or months before finding still other improvements which he built into the next one.

"**Anytime I showed** the Squangle to a

[*Continued on next page*]

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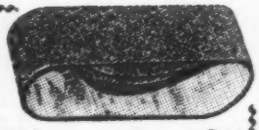

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fellow worker, the guy wanted to buy it from me on the spot," said Ove.

Ove knew he had a good idea. A Seattle builder gave him $1,000 for a 25 per cent interest in his tool and he started patent proceedings. The original $1,000 wasn't enough so the partners formed the Squangle Corp. in Washington. Four others bought into the company and an additional $4,500 was raised to have punch dies made, develop packaging and to get a sales program started.

Immediately Ove began shopping for dies to cut out the parts and to stamp degree and dimension markings on the parts. But the cost-conscious Ove, inexperienced in die-making, picked the low bidder. He got a complete set of dies for $2,000. He got what he paid for—an unsatisfactory set of dies that didn't always produce accurate Squangle parts.

Cutting expenses to the bone, Ove rented punch-press time at a Seattle machine shop at odd times. This meant dashing into town at odd hours and often on short notice, many times at night. Once parts were stamped out, they had to be carried to another shop for further machining.

Production was slow because the die design did not provide for quick feeding of metal stock. Worst of all, each Squangle had to be reworked by hand. Despite these difficulties, enough of the Squangles were finished and marketed in the local area to keep the little company operating.

The price for the Squangle was set at $9.95 to cover costs—too high for the carpenter and average handyman. The company then realized that the price would have to be pegged at $4.95 to sell.

The six Squangle stockholders each put up enough stock in proportional shares equal to 20 per cent of the company to raise more money. By the time this second block of stock was offered for sale, the future possibilities of the company had grown so that 20 per cent of the stock sold to 25 persons for $10,000.

The Squangle people finally realized that the cheap set of dies would never produce parts that could be assembled to sell profitably at $4.95. Ove took the old set of dies to an experienced die-maker and started to rework them. They soon discovered that to rebuild the dies would be

more expensive than new ones. Ove, to economize, made a new set himself, working with the diemaker. He worked around the clock; fortunately, the new dies worked perfectly and no more reworking by hand was required.

Now parts are stamped out in 2,000-pound batches. Ove still uses the presses at odd times to save expense. A ton of aluminum bar and sheet stock provides about 3,700 sets of parts. Once the parts are made, assembly is quick. All assembly work, packaging and shipping take place in the garage of the Hanson home at 6306 176th Street, S.W., Lynnwood, Wash.

It took a while to start making sales but now Squangle Corp. has full-time factory agents contacting hardware dealers and lumber yards in six western states and sales are rising. The $4.95 Squangle is praised by carpenters and how-to-workers who have had an opportunity to use it. The combination of an angle and a square is paying off for Ove Hanson. •

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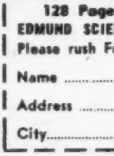

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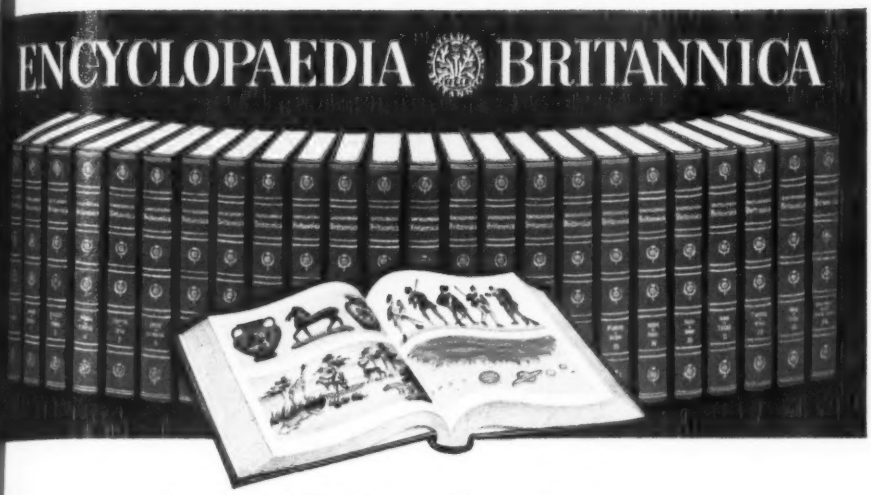

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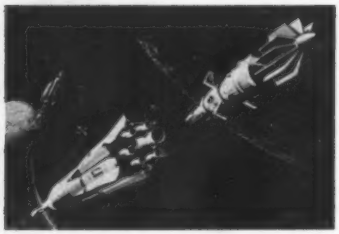

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MECHANIX ILLUSTRATED is published monthly by Fawcett Publications, Inc., Fawcett Bldg., Greenwich, Conn.

ADDRESS ALL MAIL: Subscriptions, change of address, Form 3579 to Subscription Dept., Fawcett Bldg., Greenwich, Conn.; and all editorial and advertising to Fawcett Publications, Inc., 67 W. 44th St., New York 36, N. Y.

Second-class postage paid at Greenwich, Conn., and at additional mailing offices.

EDITORIAL OFFICES: 67 W. 44th St., New York 36, N. Y. ADVERTISING OFFICES: 67 W. 44th St., New York 36, N. Y.; 612 N. Michigan Ave., Chicago 11, Ill.; 1532 Guardian Bldg., Detroit 26, Mich.; 2978 Wilshire Blvd., Los Angeles 5, Calif.; 681 Market St., San Francisco 5, Calif.; 153 S. Broad St., Philadelphia 9, Pa.; Hale Printup & Associates, Langford Bldg., Miami 32, Fla. and 1401 Peachtree St., N.E., Atlanta 9, Ga.

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SUBSCRIPTION PRICE: 35c a copy. $3.60 a year in U.S., possessions and Canada. All other countries $6.60 a year. Subscription price to members of the armed forces $2.75 per year. Foreign subscriptions and sales should be remitted by International Money Order in U.S. funds payable at Greenwich, Conn.

Member of: Audit Bureau of Circulations — Magazine Publishers Association, Inc.

JUNE, 1960

Volume 33, Number 6

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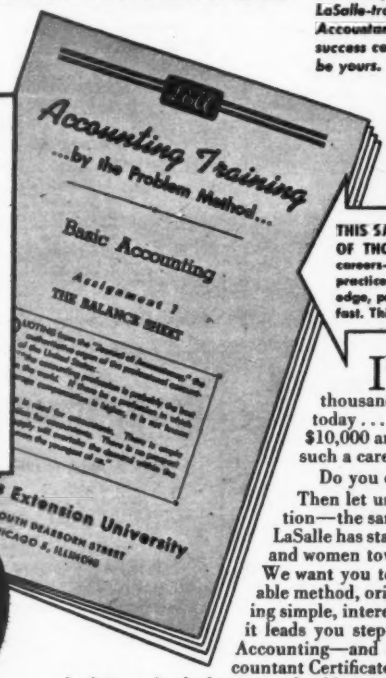

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